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The Restoration of Architectural Monuments, as Regarded by the Architects of Italy.

THE architects of Italy, as our readers are aware, had been called on to solve the difficult and important problem of the preservation or restoration of important architectural monuments long before it was debated in this country. It is true that there are in England monuments to which many of us attach an antiquity more remote than the historic date of the *Cloaca Maxima*, or the walls of Regal Rome. It is also true that the last century has seen sad havoc wrought in some of those unrivalled groups of relics. Stonehenge may not have suffered so much. But half of the wonderful lines of megaliths which made Avebury resemble an Egyptian rather than a Roman, citadel of rule and of worship, have been destroyed since Sir Richard Colt Hoare gave an account of that part of Wiltshire. This wholesale murder of the past is unknown in Italy. Where a Wiltshire farmer has only regarded the square feet of arable land wasted (from his point of view) in supporting a dolmen, or a memorial stone of some prehistoric significance,—the Italian *colono*, and even the Italian labourer, has taken a personal interest in the mighty past. Plebeian, and even patrician names, familar to the student of Latin history, yet linger on the spurs of the Apennines. And not only does the simple farmer or peasant who calls himself Valerio, Pompeio, or Mennini look down on the princely names of Medici, of Pagliano, or of Torlonia, as of yesterday's date, but a real benefit to civilisation springs from his unbroken tradition, as he holds it to be, of the great names of Republican or of Imperial Rome. The country is his own, that of the tombs and of the names of his forefathers; and each relic of antiquity, however fragmentary, is sacred in his eyes.

Whether, therefore, we look to the condition of the Roman monuments of Italy, or to that of the Christian architecture of Papal times, it is sure that the Italian architect has approached the question of preservation or of restoration with a deep sense of the gravity of the task. And as such a sense is one of the conditions most favourable for the due treatment of the subject, our readers will, we venture to think, be glad to hear something of an address on the subject of restoration which, at the close of 1879, was delivered before the College of Engineers and Architects in Milan, by an author whose name is well known in scientific and artistic literature, Signor T. V. Paravicini.

Every historic period has its natural characteristics, which, for good and for evil, are stamped upon its architectural monuments; to which an historic value thus attaches, as reflecting the manners and habits of the past. The importance of these monuments varies according to circumstances. It is subordinate to their state of preservation, chiefly as to what regards the original form of the structures; but also as to that of the ornamental features, on the alteration of which the historic importance of the monument vanishes.

The constant progress in human science, and the change of habits, of costumes, and of ornaments that has accompanied it, have been the principal causes of the fact that the greatest number of the architectural monuments of antiquity have come down to us notably altered, without taking into account those which have been miserably destroyed. The destruction of any monument is like the tearing of a leaf out the book of history. It leaves a void which cannot be replaced. It is the loss of a link in that chain which binds the past to the future. But even more mischief is effected when a monument is unscrupulously or injudiciously restored. When the slightest peculiarities, of however little apparent importance, are not respected, the originality of the monuments is destroyed, and the evidence of the past is absolutely falsified.

An ill-restored monument is to be compared to a forged document. It may lead to inferences injurious to the student, and tending to distract him from the true path of study. If the preservation of monuments is the very hinge of history, their faithful restoration is its vivification. To attain this aim has been the great care of the architects of Italy. For this purpose have been instituted the Commissions for the Conservation of Monuments, and the Archæological Societies. But, as in all new subjects, when the field has not been fully surveyed, two different systems have arisen in the minds of archæologists. And their opinion has been divided into two groups, based on opposite principles, between which, at every step, constant contradictions arise.

There exist learned archæologists who think themselves able to re-originate a dilapidated monument, and to reproduce its pristine form, without other guide than the trace of the foundations; or to determine from a time-eaten capital, or from a mutilated fragment of a cornice, all the decoration of a vanished structure. These men are regarded as visionary by those who patiently investigate all that remains of ancient monumental evidence. But they are the idols of the vulgar; who think themselves transported by their aid into the scenes of the past, as if by the shifting of a scene upon the stage.

The other school of archæologists, smaller in number, and perhaps less gifted with fancy, only see, and only will see, in a monument that to which it bears direct witness. Men of this school seek to respect history in restoration. They would remove from a monument every appendix which deforms or disguises its original appearance. But they respect the whole. They would repair it as we repair an old coat. They would not renew it. They would add nothing to it. When in doubt, or when compelled by structural reasons to add something, they will so express that doubt that the student who examines the monument will be led into no error, but will be able at once to distinguish the old work from the new.

By this system a restored monument becomes a living page of history, where all can read without fear of being misled. And if any error, or the inexact interpretation of any part, should find its way into the work, it may be detected without danger to the fidelity of the actual record. The main source of danger lies in that subserviency to public opinion which leads even learned archæologists to dread leaving a monument in a state which the vulgar will call incomplete. It is this which leads to tampering with the monumental evidence of history, and which produces a compound structure, in which it is difficult to distinguish the true from the false, instead of a truthful record, without additions, without erasures, without corrections; bearing on its face the impress of the time which has passed over it.

To prove how important in a restoration it is to show respect to every peculiarity of a monument, even when it may appear to be a defect, it is sufficient to reflect that it is often that very peculiarity, that real or supposed defect, which forms the special character of the edifice,—its very physiognomy.

It may be of use to cite examples of this fact. The first may be taken from those cases where the axis of the altar, or of the choir, is at an angle with the axis of the nave; which is a feature of the Lombard churches of the ninth, tenth, and eleventh century.

Thus the tabernacle of the great altar of the Church of St. Ambrose, in Milan, lies obliquely to the axis of the church, being directed towards the pulpit, that is to say, towards the left hand of those who enter the church, or, as we should say, the Gospel side of the choir. This being regarded as a blunder, the altar, together with its tabernacle, was, by a dangerous and difficult operation, conducted with much skill, wheeled on its axis, so as to coincide with the centre line of the church. But was there here, indeed, an error in construction? What was the reason for the obliquity of the axis? Are we in a condition to accuse the builders of ignorance, because we are ignorant of the reasons for which they adopted this irregular construction?

The church of the Madonna del Castello, near Bergamo, presents a similar inclination, not of the altar only, but of all the eastern end of the building. The same inclination occurs in the

church of St. Michael at Pavia, in so far as regards the great arcade which leads into the presbytery, the choir, and the steps leading to the choir. Nor are these isolated cases. San Giovanni in Borgo, San Pietro in Ciel d'Oro, San Teodoro,—all churches of Pavia, of the same period,—have the same inclination. So also have the churches of San Lanfranco, near Pavia, S. Carpoforo, and S. Fedele at Como. No church has yet been found with an inclination in the opposite direction.

We may add here that a similar inclination of the three eastern chapels is found in the church of St. Mary, at Guildford, of which the central tower, with its external "strips" or pilasters, and with its double splayed windows, reduced to a size which it would be impossible for a man to enter, is referred by competent archæologists to Saxon times, bearing witness of the fear of the Danes.

Was it, then, proper to alter the line of the high altar in the church of St. Ambrose? Was not that alteration the destruction of an irrefragable piece of evidence, which demanded an explanation? If at the period of this restoration architects were ignorant of the fact that other Lombard churches showed the same obliquity, was not this a reason for making diligent research? And even if it were a sole case, was that a reason for its destruction?

When the author of the paper we have cited, in conjunction with the engineer, Signor Magni, was entrusted by the Royal Academy of the Fine Arts in Milan with the restoration of the ancient basilica of St. Vincenzo in Prato, a case presented itself which was rare, if not unique. In the principal façade were two doors, the larger in the centre of the nave, the other smaller, giving entrance to the left aisle. No door had ever existed on the corresponding side. Whatever was the reason of such an anomaly, it was certainly not an error.

Sometimes, indeed, the anomalies of construction are such that it requires the most scrupulous conscientiousness on the part of the architect to respect them. It is only the conviction of their essentially historic nature which compels him to do so. Such is the case with regard to the façade of St. Michele Maggiore at Pavia. On this are to be found the irrefragable traces of the ruin caused by the Hungarians in the year 924, which left only a few feet in height of the walls standing. Above this is the first restoration, executed in part with fragments of the original wall. There are the marks of the second restoration, after the damage caused by Henry II. in 1004. By restoring the lines of the main architectural features by additional pieces, there would, no doubt, be produced a greater appearance of regularity and of unity. But who could then study the genuine date of this church? Sigonio, Bossi, and other writers say that it was founded by Constantine the Great (315-325 A.D.). Gualla attributes it to another Constantine, king of Italy. Capsoni and Malaspina say it is of the period of the Ostrogothic kings. Others assert that it was founded by Agilulfo, duke of Turin, on the occasion of his marriage with Queen Theodolinda. Viollet-le-Duc dates it in the Carlovingian period. Dell' Acqua, perhaps with more reason, attributes it to the Comacini masters, in the Lombard period. To what testimony can we appeal as to this historic monument if it is obliterated from the walls themselves?

The above mentioned church of St. Pietro, in Ciel d'Oro, partly crumbled with age, for the restoration of which the Minister of Public Instruction has provided a considerable sum, presents two notable peculiarities,—one in the narthex, the other in the pillars which divide the façade, one of which is nearly double the size of that to which it corresponds, without any apparent reason.

It is undeniable that those very monuments which present anomalies, or bizarre distribution of parts or of details, are those which possess most interest for the research of the student, and are also those which are most likely to be modified, and thus historically falsified, by the modern desire for harmonious restoration. And if the architect entrusted with the task be one who has his own decided views on the history of the art, the danger is very great. For if he meets with peculiarities of structure which are not, or seem not to be, in accordance with his ideas, he will be strongly tempted to modify them according to his system, even if he be not anxious to destroy any evidence which may appear to contradict his views. The artist who is at the same time a scientific man, is exposed to incertitude which can only be dissipated by absolute respect of ancient forms.

It sometimes occurs, in the restoration of an ancient monument, that the architect encounters ancient restorations or alterations (as in the case of the church of St. Eustorgio), in which it is impossible to distinguish between the original and the ancient additions, and where doubt exists as to the form of the mutilated parts. In such cases it is absolutely necessary to save as much as possible, even at the cost of sacrificing unity of conception. That, in point of fact, has been the practice in all the most satisfactory restorations in Italy.

Here may be mentioned the system followed in the restoration of the Erechtheum at Athens and of the Triumphal Arch of Titus at Rome. In these and some other monuments, in order not to mislead the student, the reconstruction of the fallen parts has been distinguished from the original work either by the employment of different materials, or by suppressing the ornament or finish of the modern parts. This is certainly the scientific *beau ideal* of an archæological restoration, and is the method best adapted to monuments now out of use, and which are preserved as types of their epoch.

In Paris, very recently, the reconstruction of the Tuileries and of the Hôtel de Ville has been projected on the principle of distinguishing each successive addition by its proper contemporary style, a method as advantageous on the ground of art as on that of history. Such, it has been argued, would be the best mode of comparing the works of the ancient and the modern artists, giving to each his own, without sacrificing either the one or the other.

But it is not always the case, as it is with the Tuileries and the Hôtel de Ville, that we possess the ancient designs, and are familiar with the history of the edifice. Very frequently the reconstruction of part or of the whole of a monument is absolutely indispensable to avoid its utter ruin. This is a common case with buildings of Mediæval date, or of the period of the Renaissance.

For it is the case, whatever the admirers of the romantic school and the worshippers of the wonderful secrets of the Freemasons may say, that construction is the weak point of the architecture of the Middle Ages, and especially of the Gothic style. From this point of view Mediæval is absolutely inferior to Classic architecture. In proof of this it is only necessary to compare the aged and decrepit appearance of a cathedral of the Middle Ages, with the aspect of power and of youth shown by the Greek and Roman buildings of fifteen or twenty centuries earlier. This inferiority is principally to be ascribed to two causes,—one is the bad quality of the materials employed in the later work; the other is the very spirit and essence of the Gothic style, which, in its pursuit of lightness in the supports, and of lofty height in its vaulting, flies in the face of those static laws to which opposition, for such works, menaces a speedy ruin; in other words, the difference between trabeated and arcuated construction.

In fact, the flanking towers of the church of Santo Stefano at Vienna, which date only from 1433 (having been commenced in 1359), have been, within the last few years, entirely demolished, in order to be rebuilt; and the Cathedral of Evreux, of which the oldest part does not date before the twelfth century, has been declared in imminent danger of ruin, and requires an almost total reconstruction.

It is in such cases of general reconstruction that archæologists and architects are most divided as to the mode in which the operations should be conducted. In France the diocesan architects responsible for the conservation of ancient monuments hold that in certain cases modifications of the original edifices are permissible which would be impossible in a simple restoration. On this head may be cited the report of M. Viollet-le-Duc to the Inspector-General of Diocesan Edifices, dated 27th of January, 1873. None the less are such changes apt to disfigure and falsify the monumental character of the buildings by substantially altering the principal parts, with the aim, says the report, "of reducing the edifice to unity of style [which, probably, it never possessed], or of strengthening the construction.

Is it to be taken for granted that, with all the modern means of construction at command, we are unable to do what earlier builders did? or to raise buildings that shall endure for five or six centuries without danger of falling? Is not that an admission, not only of inferiority in the art of building, but of incapacity even to imitate the models set before us? Such changes, then, are only inspired by a modern vanity; by the desire to show, not only that we are profound connoisseurs of the styles of past ages, but that we know more about them than their very inventors themselves! assuming to lay down the law as masters, and to correct the monuments of the past. Thus, as a case in point, it is proposed, in the reconstruction of the cathedral of Evreux, to raise the vault of the nave in order to make it "more Gothic!" And as the counterforts are surmounted by double flying arches,—a mode of treatment very rare, if not quite exceptional, in France,—it is proposed to substitute single for these double arches, in order to "correct the style," and to reduce the cathedral to a unity of style which it never possessed, at the cost of all its special character and original physiognomy.

Unfortunately, this evil example has been followed in Italy.

The windows of the apse of the Basilica of St. Ambrose, at Milan, were rebuilt in about the thirteenth century; and not a trace remains of the original design. But on the recent restoration, no hesitation was felt in destroying the thirteenth-century work, and replacing it (following no guide but the imagination) with what it was presumed ought to have been the original forms. In the same way the magnificent portico of Bramante was altered, to replace a flank of the Basilica, which had been destroyed for centuries to give entrance to the lateral chapels.

When the municipality of Milan decided on restoring the great hall of the Palazzo Marino, in order to use it for public assemblies, the whole of the lower part was restored in a style altogether different from that of the remainder of the building. The upper frieze, which Alessi had judiciously left plain, in order to give repose to the eye, and to indicate the structural lines of the building, was overcharged with a confused ornamentation of foliage of different colours, intermingled with gold letters, out of all harmony with the paintings on the walls. Even the magnificent soffit underwent great modification; the gilding was scraped off the *bassi rilievi*, which had served to connect the painted and the architectural portion of the building. And the whole effect was vulgarised by the introduction of modern gas-pipes.

Even the Council of the Royal Academy of the Fine Arts in Milan has so far forgotten the responsibility which lies upon it, as judge in the competition for the restoration of ancient monuments, as to have given the prize for the design for the restoration of the abbey church of Chiaravalle to a competitor who has taken no account either of the remaining portions of the ancient narthex, or of the painting in the church itself, representing the original façade in which the narthex is shown.

It is thus evident that the question of the archæological restoration, and that of the true preservation, of ancient monuments is yet far from being rightly solved. We must frankly confess that, in certain respects, the archæological restorations of the present day are more destructive to ancient buildings than was the churchwarden work of the eighteenth century. In those rude additions or alterations there was no chance of mistaking the hand of the workman. It told its own tale. The learned additions of the present day, on the contrary, are likely to prepare a series of errors for the misguidance of the future. Such are the opinions of the accomplished Italian architect, which may help in the discussion, though they certainly will not conclude it.

Edinburgh Architectural Association.—At the fortnightly meeting of this association, on the 31st ult.,—Mr. Whitelaw in the chair,—a paper on "Scottish Domestic Architecture during the Sixteenth and Seventeenth Centuries" was read by Mr. Archibald Macpherson, architect. After referring to the necessity for a basis on which to found ideas of design in domestic work, Mr. Macpherson proceeded to review briefly the history of domestic architecture in Scotland generally, showing that the most favourable period for its development was embraced by the two centuries named. The features of plan and the details of the style were then described and analysed, and, in conclusion, its study was recommended.

AID TO SURVEY PRACTICE.

The author of this work,* who writes on a basis of extensive surveying practice in various countries, considers that there is a want of a book of convenient size treating of the science and practice of surveying generally. As in a good many other such cases, the book seems to have been suggested by the inquiries of the writer's own pupils in regard to a work for general consultation, and his inability to find one which he could recommend as meeting the purpose. He found, he tells us in his preface, many books on surveying, some dealing exclusively with chain-surveys of small plots of ground; some dealing only with large trigonometrical surveying operations, carried out with enormously expensive and refined instruments and appliances; others intended to deal with special features of railway work, and the preparation of Parliamentary plans for railway Bills; while some served rather to aim at presenting the student with a large set of nicely-drawn plans for him to contemplate as models in drawing rather than as supplying him with information useful in surveying. Each of these works, however excellent for a special part of the study, failed to serve as a general guide in survey practice, and there remained only the alternative of getting a small library of reference books, or of giving the pupils written instructions. The latter course was adopted, and the notes thus furnished for educational purposes are now condensed into the present volume; not a short or rudimentary treatise (for it numbers over 350 pages, and goes into many points in considerable detail), but still a book of handy and convenient size.

A considerable portion of the book is reprinted from the author's Curve-book (the result of experience on the Metropolitan Railway); the portions dealing with general surveying and instruments, and with route surveys, are new; the first-named portion being the substance of notes given to pupils, the latter the result of observations condensed for the author's own use in an intended route-survey from India to China, abandoned by the advice of one of our representatives in China, who feared that the expedition would share the fate of a previous one, the members of which met with barbarous treatment at the hands of some of the enlightened natives of the Celestial Empire. The author has excluded, except in the way of passing references, the work of great trigonometrical surveys, such as would always be carried out by thoroughly experienced hands only, and with the aid of exceptional instruments and preparations; and he has also excluded mere details in regard to instruments which are in common use and can be seen and handled anywhere, and other merely rudimentary matter, the book not being intended to make a surveyor out of a person entirely ignorant of the subject, but to help the student in his progress, and give the practitioner useful memoranda and tables for consultation.

This is the author's own statement of the object and scope of his book, which appears only to differ from its description in containing a rather larger proportion of details of preliminary instruction than the preface would have led one to suppose, so that the learner who may take it up will really not require to have had more than a very little general acquaintance with the way in which surveying is carried on, and with the simpler methods of calculation employed. This is so far in favour of the work; for it is in all cases better to explain too much than too little. In the main it may be said that the author brings to his work a fortunate union of theory and practical experience, which, aided by a clear and lucid style of writing, renders the book both a very useful one, and very agreeable to read.

This last praise may seem to some out of place in regard to a book with such a practical and technical object; yet, though such a work cannot be classed as literature, there is a great difference between a book which is well written and one that, however learned, is clumsily put together and expressed. But apart from this question of literary form, it is surely a mistake to regard surveying as the essentially dry and uninteresting class of work which many people seem to suppose it to be. Looked at from a theoretical point of view only, there is much that is interesting in connexion with the science. The immense value to society of correct delineation and measurement of the earth's surface and features, whether on a large or small scale, and the triumph over material obstacles obtained by the instruments and the geometrical formulæ which enable the observer to grasp the dimensions and relations of extensive and broken tracts of country, and reduce all their details to scale with systematic accuracy; and the variety of circumstances and climates and scenery under which this important work has been carried on little by little over the greater part of the earth's surface, present to the mind a total impression of great interest. And the actual operation of surveying, under fairly favourable circumstances, is certainly anything but a dull and dry occupation. The open-air life, accompanied by work which calls forth in a high degree the powers of observation; the interest afforded in surmounting obstacles; the manner in which the apparently chaotic irregularity of the line of country, as at first viewed in a *coup d'œil*, becomes systematised and dissected till all its secrets and surprises are mastered, combine to make surveying one of the most healthful and interesting occupations to a good workman in it; and it has the advantage of being one of the few branches of work left for educated men in which no one can say there is any "humbug": the object to be attained is a practical and useful one, it is clearly defined, and the most direct methods are taken for reaching it. The only bit of humbug which can be brought into surveying is not in the field-work, but in the subsequent delineation of the work, in which no doubt some surveyors indulge in affectations of finish in representing trifles, and in the artistic elaboration of scales and north and south points. But, as far as the field-work is concerned, there are few healthier or more interesting occupations than a survey over open country.

Turning again from these general considerations to the special objects of the book before us, we may note that the chapter on instruments for measuring distances contains, in addition to descriptions and considerations of the theory of some of the less familiar instruments, detailed suggestions as to the many sources of liability to error in the instruments in more ordinary use, and the best means of eliminating or reducing to a minimum these errors,—suggestions which cannot fail to be of use to young surveyors. In speaking of chaining, the author draws attention to the advisability of marking the chain with a distinct form of mark for every ten links, instead of the practice of using the same form of mark, linked on the reverse way, on either side of the centre of the chain. Every one who has done much chain-work with this latter and most usual method of dividing the chain will know how many mistakes have arisen from reading 40 links for 60, and *vice versâ*, and how much additional care is required on the part of the man who has to read the chain in this case, compared with what would be required with a continuously marked chain. The author subjoins one or two statistics as to the average accuracy of chain measurements, which, as he truly observes, are very much affected by the personalities of the chainers. He quotes experiments showing that the average error was $\frac{1}{350}$, and sometimes as much as $\frac{1}{170}$, in using two sets of chainmen; the latter, which is nearly half a link per chain, is a very large error, and we cannot believe that anything like that is unavoidable with different sets of chainers, if both sets knew their work properly. The same authority gives $\frac{1}{1000}$ as the average variation when employing the same set of chainers and materials. Our impression is that with anything like proper care and common sense on the part of the chainers, the chain is a very accurate means of measurement on ground that is not exceptionally unfavourable to it, but that it is too much the custom to entrust chaining to a class of men who are not sharp enough to understand how to handle the chain and marks so as to ensure accuracy. It is impossible for a stupid man to do it properly, however carefully directed. We have once or twice witnessed remarkable accidental proofs of the accuracy of chain measuring, in cases where, for some reason, the same line had to be gone over again, and this even on sloping ground, and with stopped chaining; but these were cases where the chain was being handled by trained pupils, and not by ordinary workmen. The application of a trained mind tells in even the smallest manual operations of this kind.

In the opening pages of the chapter on surveying, the respective merits of various methods of procedure are discussed, and their relative advantages under special circumstances pointed out. The author very strongly insists on the importance of means of verification for every point in the survey, and leaving nothing to depend on a single measurement; and also on the advisability of determining the limit of allowable error for each survey before commencing, considered in relation to the ultimate scale to which the work is to be laid down, so that there may neither be too little accuracy, nor any waste of labour in attaining a degree of minuteness which could not be represented on the scale of the drawing when plotted, a point which is often overlooked. The chapters on surveying and levelling are very complete and sufficiently illustrated, but, of course, in the main, present nothing for special comment, treating of problems and difficulties which are incident to operations of this kind everywhere. There are, however, some special remarks in regard to one source of error in levelling under certain circumstances, which may be specially noticed. The author says that his own experience in canal levelling on one occasion, where very slight and gradual fall has to be provided for, forced upon him the conclusion that ordinary levels were not to be depended on for work of this kind; it is necessary to use an 18-in. level, and to guard against all possible sources of error; and he mentions some very delicate and minute errors, obtained from the results of the Indian Trigonometrical Survey, which certainly are not suspected by many operators. One of these is that in levelling along a very long and really level line, the observation constantly tends to represent the further end as lower, and that this inaccuracy increases with the distance, the result of one's work showing the distant point to be always lower than it actually is. The difference arising from this source of error, though slight, is always in the same direction, and greater in proportion to the distance levelled over. The author is unable to assign any cause for this error. Another minute source of error is the action of the sun on the telescope, which tends to raise the end of the telescope towards itself and to depress the opposite end. "The amount of this was proved by the surveyors of the Indian Great Trigonometrical Survey by adding together algebraically the respective level-corrections of each instrument for a whole season, when the negative corrections were found to predominate in every section worked from south to north, and the positive corrections in the opposite direction." This is allowed for now, and the levels are, besides, always shaded from the sun by large umbrellas when set up for observation. The greatest amount of deviation from this cause amounted to 3·55 ft. in 310 miles, and the least to 1·55 ft. Such are the difficulties in the attempt to obtain perfect accuracy in observation: traps seem to beset the observer at every step, some due to the subtle influences of external conditions of nature, some to the imperfection of mechanism, some to that very mobility and sensitiveness which constitute the special beauty of the human instrument in regard to many objects in life, but render mechanical accuracy for ever impossible to it.

The examples of methods of entering work in the field-book, given at the end of the volume, are very complete and clear, and readily understood even by a beginner. The whole illustrative portion of the book seems to be admirable, no more being given than is necessary to illustrate each method of surveying, while the drawings which are given are thoroughly clear and explanatory. Some of the diplomatic or social difficulties of the surveyor's profession are touched upon in the chapter on route-surveys, which often include a great deal besides surveying. "It frequently happens, too, that the mere sight of surveying-instruments exercises a most irritating effect on the inhabitants, who look on them as forerunners of annexation, loss of independence, or religious interference. Under these circumstances the survey-work and the observations have to be partly carried on by stealth, and frequently with a great deal of hurry, which is very prejudicial to good work. Sometimes armed opposition or insatiable demands cannot be avoided, but are rather increased by any amount of tact and forbearance. In this case prompt and severe measures must be relied on, without regard for the opinions of those who are

* Aid to Survey Practice, for Reference in Surveying, Levelling, and Setting-out, and in Route Surveys of Travellers by Land and Sea; with Tables, Illustrations, and Records. By Louis d'A. Jackson, A.-M.I.C.E. Crosby Lockwood & Co. 1880.

not fully acquainted with the circumstances, or who are adverse to the success of the expedition." This last recommendation is the commonsense of the business, but it suggests the idea of matter for a very pretty quarrel between rival politicians in regard to the treatment of "unoffending natives." It is significant that surveying-instruments should be regarded as the pioneers of change. "Science is measurement," as Mr. Marks showed us in his diploma picture; and, in a sense, civilisation is measurement also, or, at all events, measurement is certain to mean civilisation. Mr. Jackson has provided a useful companion for this class of civilisers.

CONTEMPORARY ARCHITECTURE FROM A FRENCH POINT OF VIEW.

WE can scarcely follow in its length M. Trélat's able enunciation of the formation of the contemporary spirit which rules French architecture.* Suffice it to summarise his sketch by stating the influence which the social events of 1830, coming as they did at a critical moment in the history of art, of letters, and of politics, exercised necessarily on architecture. Romanticism affected its ranks also,—the works of De Caumont, still more, his efforts in the direction of a proper understanding of the past art of France; the warm and eloquent appeals in this direction from Merimée and Vitet; the formation of the commission of the historic monuments; and, at the same moment, the appearance of the early essays of Viollet-le-Duc which prefaced his great "Dictionary of Architecture," all aided in producing an immense change from the long-existing traditions of Classicism. The vigorous initiative given served unquestionably the ends of art, but pursued it directly; while in literature the new movement was to grow in intensity, in architecture the work of emancipation slackened sensibly. To the brilliant preludes of the young initiators succeeded the division of efforts; civil war was declared, and the diversions it produced drew off attention from the general aim. The separation was disastrous; and the new generation springing up, instead of exercising a combined action, only served further to divide the first efforts of the initiators.

In the midst of the new movement of research into the past, which forms the chief feature of the romantic movement, the world was explored by enthusiastic artists. Greece, Egypt, Asia, Europe, from end to end, were visited, described, and illustrated; with some, the East became a source of inspiration; others were inspired by that mother country of great art, Greece; others, again, by the national art of the Middle Ages; and in the midst of all these various and beautiful fields of study, little wonder is it that some confusion should have resulted.

Society,—and we quote this passage as a brilliant summary of the causes which have influenced contemporary architecture,—society, which forms and moulds all art, was transformed. From sedentary and monotonous, it became mobile and varied. The capitals overflowed their bounds. The extremes of sumptuous palaces and squalid houses were familiar; a need was expressed for habitations between these two limits. Fantasy and fancy exercised largely their influence. The public administrations commissioned, turn by turn, edifices without character, and monuments without measure. The instability of the habits, the incoherency of the ideas, of the public at large, offered to art a foundation of no consistency. The spirit of the architect was frittered away in a thousand secondary cases, which ruined little by little his artistic aptitude. Add to this, three consequences of one great fact. The inflow of the population into the great centres necessitated their entire rebuilding. This brought about a division of the property, the lessening of the size of the edifices. This again engendered a punctilious series of regulations which confined the forms of architecture within certain lines and undeviating limits; finally, it necessitated haste in works urgently required. Obstacles thus arose in the applications of the architect, as well as in the data of his task. He was obliged to move in a field confined by space, and diminished by police regulations; and his plans were to be made without prejudice, without meditation, without experience.

A further factor, which M. Trélat very justly terms the greatest modificator of modern society, that which has taken the largest share in our life, and which regulates it in every circumstance,—the economic spirit,—came to trouble the architect. The power of this new factor, as shown in its innumerable applications, it is impossible to resist, and with the aid of industry, and its special aid the engineer, its development is daily visible. Of the engineer M. Trélat observes,—"The task he serves is as simple as it is great. His edifices never contain but the strict quantity of material necessary for their solidity and duration, but this is his sole aim. He lays under contribution all the science of his day." With the architect his aim reaches further than merely keeping in their place the walls, the flooring, and the roof; his task is to conceive and carry out buildings which, above all, are harmonious forms, to charm the mind through the medium of the eye. As M. Trélat suggestively and epigrammatically puts it, there is a world between architecture, which is plastic art, and the art of the engineer, which is mechanics.

But the appearance of the engineer on the field of action, left till then undisputably to the architect, aroused his justifiable distrust, and the architect tried to appropriate the constructive methods of what M. Trélat roundly terms "his adversary," but he copied maladroitly their processes and injured his works. In the midst of this crisis came the avalanche of works which the Empire commenced; architecture, construction, measure, form, proportion, all the secondary ideas which serve and support the architectural idea, were confounded, and ceased to possess a definite meaning. Each artist employed them according to his lights, to the detriment of the general idea; and it is the exterior mark of this terrible disarray, as M. Trélat calls it, that he has attempted to portray.

M. Trélat admits that he has spoken freely. Architecture is in a critical state, but he hastens to assure his readers it is not in peril. It has passed through terrible trials without succumbing, leaving on its passage more than one work of incontestable merit. In addition to this, never, it is M. Trélat's opinion, have such a large number of talented artists, of such varied types, served architecture, as at the present moment. An art, as he remarks, which is thus situated can scarcely be said to be dangerously ill, it is suffering from a gestation; not that in the opinion of the worthy director and founder of the "École Spéciale" a new style of architecture is on the point of appearing. The gestation to which the writer refers resembles that which occurred with literature and the other arts after the enthusiasm of the romantic campaign. It is the adaptation, our author continues, of art, and of its exigencies to remain art, of the needs to the spirit, and to the taste of the society which employs it. In literature this period lasted only some twelve or fifteen years, but for architecture it will have lasted some fifty; the gropings of architecture are slower, monuments of stone being more rare than those which are printed.

In the fact that little but the acquirement of certainty regarding the art of the past remains now to be laid before the world, to which a few years since the discoveries of foreign explorers were novelties, the writer sees a powerful factor in the regeneracy of the art. It is impossible not to perceive that within the last quarter of a century the contemporary architect has displayed a skill and a persistance which have rendered him almost master of the difficulties accumulated before him by circumstances. Our great cities, and their densely-crowded sites, so unpropitious to private architecture, will never be transformed, he fancies; but the ingenuity displayed in the plans, in the interior arrangements, will further afford conditions favourable to the production of great works, but in this advance M. Trélat looks forward with hope to the day when the architect and the engineer shall have ceased to combine each other's processes.

Drawing to the conclusion of his article, the writer expresses his gratitude to the action of the different schools which had served to free architecture from its lifeless condition; but these schools now, he remarks, very justly, are injurious in their effect, as they produce division and discord; they become dangerous because they waste the forces of the artists in division, and the confidence of the public in the difficulty of understanding their several aims. It is time that they should coalesce in one general doctrine, a sentiment which cannot fail to find supporters as much on our side of the Channel as on that of M. Trélat's brother artists. The fifty years of study, of trial, and of experiment which we have passed through, leave us a wide and ample field for observation, which solicits a conclusion, and here is the conclusion which M. Trélat draws.

A work of architecture must possess three properties, which the artist realises necessarily in the following order: to be well built; to be well distributed; to be well formed. The observer must remark in it three qualities, which, according to their relative importance, will strike him in the following order: the form will attract his attention first of all. It is that which will first appeal to his mind; the destination, the distribution, next follows; and in bass notes, and after having remained discreetly in oblivion, the construction will take part in the concert, if it is sought; and then it will not fear to show its necessary virtues. Architecture is defective when these three factors are developed singly or without just proportion. They must be united, and subordinate themselves in the general expression for the work to be one of art.

Such, in the opinion of the learned professor, is a formula which is elastic enough to leave to the artist the choice necessary to his temperament, while, at the same time, it gathers together the scattered efforts of architecture, and unites its vague and uncertain currents into one general direction. When this position is arrived at, every one will understand architecture, and will discuss it practically. Criticism and public opinion will then be called into existence. Then architecture will renew the formal qualities it has lost. The writer very justly regrets that, "with some rare exceptions, outline, and especially reliefs, have disappeared from the façades of modern French buildings. The architect has ceased to understand the value of 'modelling,' and what small use is made of its valuable aid is lost in the effect of the whole, even where colour has been employed. Were we not divided into coteries of artists enamoured of little secondary rules, and our attention turned away from the more important, if we had all the consciousness and the belief that the outline, the silhouette," as M. Trélat terms it (the sky-line as we might call it), "relief and colour, which are the three ends and aim of plastic art, are the resources also of architecture, we would have already reacted against the faults to which I have made reference." In his belief, the way is open to this conciliation between the various architectural schools from which he very justly expects such excellent results, and he concludes his article by an appeal to the profession to endeavour to take the necessary steps to this cancelling of petty differences, which work such sad havoc in the architectural world. In itself the article of M. Trélat deserved our attention, had it alone presented a picture of the condition of French contemporary architecture; but the position so strikingly resembles, with differences, however, be it remarked, the position in our own artistic world, that his words possess a double value. That same indifference and ignorance expressed by the public, so warmly interested in the other branches of art, of which the French Professor complains with his own countrymen, how often has it not formed the subject of like remark and regret on the part of English professional writers and speakers? The day that the public mind is seen to be fully interested in the progress of architecture as contributing to the fulness of their everyday life will be indeed an important one in the history of the art. For many years the *Builder* has worked unremittingly, though without assertion, in this direction, aiming to obtain for architecture and the architect an increased and increasing audience. We may express a modest hope that the aim has not been wholly missed.

Transmitting Forms by Electricity.—A patent for the purpose of transmitting scenes to a distance by means of electricity has been applied for at the U.S. Patent Office by Messrs. Connelly Brothers & M'Tighe, patent agents, Pittsburg. According to the *Electrician*, the inventors believe that two persons talking by telephone, will also, by their device, be able to see each other, and that a printed or written document can be seen in this way and read off. A single wire is required to transmit a diminutive image which is magnified at the receiving station. Here, if anywhere, seeing is believing!

* See p. 406, *ante*.

THE THREATENED PYRAMIDS.

The threatened destruction, or even purposed maltreatment, of the world-famous Egyptian Pyramids is a serious matter. The Pyramids of Egypt would seem to belong to the very earth itself, and to form almost a part of it, and to be as safe from possibility of destruction as any one of the earth's mountains, so everlasting do they seem. But, nevertheless, they are threatened with destruction, and but for some world-wide protest, and, may be, actual diplomatic interference, so dire an event may actually come to pass. To help in the protest against it may be useful, and towards it we may recall a few facts and thoughts concerning these wonderful monuments, most surely the greatest and most impressive that have ever been built up to perpetuate the memory of a human being, however exalted. World-famous as they are, they perhaps as yet hardly have been treated of by some as they should be. It would be hard, indeed, to put ourselves, in these mechanical and matter-of-fact days, in the place, even in imagination, of an Egyptian in the days of the Pyramid builders, or to take part in any way in the building up of so gigantic a structure and one of such solidity as the Great Pyramid of Cheops.

So many and so varied are the matters which crowd on the memory, and which claim attention in connexion with these monuments, that it is difficult to determine what is most worthy of note,—the minds and motives of their founders and builders,—their situation and number,—the planning and building of them,—their architecture, externally, and the mystery of their interior arrangements, and the purposes of the several parts and passages and chambers, with much else,—the far-off dates of their building,—or the notices of them by the many who have through so long a succession of generations travelled far to see them, and to wonder at them, from the days of Herodotus and Diodorus Siculus, down to those of Colonel Howard Vyse and M. Leynard, who has "photographed" them. We can here but glance at so vast a subject, so full of curious detail.

Historian Herodotus would seem to have been the first to make note of the Pyramids, and he it was who tells us that Cheops was the builder of the Great Pyramid, and that no less time than ten years was taken up in the construction of the causeway along which the huge stones of which the structure was built were drawn, and that a hundred thousand men, for ten years, were employed on it, relieved every three months: a work, he says, not much inferior to the Pyramid itself. Twenty years more were expended on the construction of the Pyramid; and he gives the details of its mode of construction, in successive layers or steps, and by the aid of rude wooden machines, the hand power of the vast multitude of workmen doing, indeed, the whole work. As many machines, he says, there were as layers, or steps; the final finish of the work being from the top downwards,—a proof, indeed, of what it is possible for unaided body and hand work to accomplish. It is to be noted that the whole of the outer casing of the structure is gone, and has been used at divers times in the building of mosques and other structures not far from the Pyramids, so that all the hieroglyphic writing once on it, and doubtless explanatory of its motives and purposes, is gone, not to be recovered. It would be not a little curious to read now of the pride and purposes of the founder and builder of the Great Pyramid. But even Cheops, great as he was, had his troubles and difficulties, for the old historian tells that, so pressed was he for money to go on with his gigantic works, that he charged his daughter to obtain for him a certain sum. She not only did this, but, to leave a memorial of herself, requested from each one of her friends a stone for the work, and of these built another pyramid. Thus far Herodotus, who got his information, as he says, from the priests themselves. Diodorus Siculus was the next to leave an account of the greatest of the three Pyramids, one of the Seven Wonders of the World, built entirely, he says, of solid stone, of difficult workmanship, but eternal in duration. The most wonderful thing about it, as he thinks, is the fact of there being no trace left in the sand surrounding it of the working of the stone, so that the whole fabric appears to have been placed on the sand, not gradually, by the workmanship of man, but by the instantaneous agency of a deity. It is curious to note, nevertheless, that there yet remain, to this day, vast mounds of the chippings of the stone, and of the very materials which were mixed for the mortar, on the brow of the hill to the north of the Great Pyramid, as noted by Colonel Vyse.

Strabo is the next of the ancient writers who has made note of the Pyramids, or "Sepulchres" of the Kings; then Pomponius Mela, and then Pliny, who terms them those "idle and foolish exhibitions of royal wealth"; for the cause, he says, by most assigned for their construction, was the intention on the part of those kings who built them to exhaust their treasures, rather than to leave them to successors or plotting rivals! He gives a long list of the authors who had written about them, adding that none of them make it clear who it was that built them, and thus consigning to just oblivion those who so vainly built. He speculates curiously on the precise mode of their construction, and gives some very puzzling details.

Thus far the antique historians. The first of those after the Christian era, and in the eighth century, to make note of the Pyramids, was Lyncellus, a monk, who contends that the Great Pyramid was built, not by Cheops, but by Suphis. He was followed in 1440 by Cyriacus, who made "drawings" or "plans" of the Pyramids; he again, in 1484, by Breydenbach, of Mayence, who was followed by a number of travellers during the Middle Ages, who all could but wonder more or less at them, and speculate curiously on their purpose and colossal proportions, and as to the men who could possibly have built them. Among these was Rabbi Benjamin, who wrote his adventures in Hebrew. He says that the granaries of Joseph were close to the Pyramids, and were built with matchless skill. It would seem that some of the destroyed pyramids were traditionally called "Granaries of Joseph." We might thus go on and give a long list of those who have seen and described the Pyramids, down to Niebuhr in 1761, who gives measurements, and Volney, 1783, and Denon, in 1799, who carefully examined the interior of the Great Pyramid, and Belzoni, in 1817. Sir G. Wilkinson wondered, with others, that no hieroglyphics have been met with either in the interior or on the exterior of the Pyramids, and that, above all, the sarcophagus should be destitute of those sacred characters so all but universally found on Egyptian monuments. Herodotus though, be it observed, tells us that he saw an inscription on the front of the Pyramid. And the Arab writer, Abd-el-Azees, also mentions the existence of hieroglyphics on the Great Pyramid. This probably was so; but as the whole of the outer and polished casing stones of the Pyramid are gone, we cannot be sure either one way or the other. Many Arab writers and travellers have also left accounts, more or less to be relied on, of these famous Pyramids, so that no nationality has failed to be impressed by them, or to wonder at their dimensions and at the mystery involved in them. Some of the speculations of these Eastern men are not a little curious and imaginative. Giants were thought to have built them, and the ancient kings of old Egypt were not only, with their treasures, buried in them, but they will again return to this world and do yet greater deeds. One of these authors, Ahmed Ben Yahya (741, A.H.), who wrote many volumes, contends that these Pyramids were sacred to the stars; that they were tombs, and built also to contain books and treasures, and for places of refuge during the Deluge, and that each one of them was dedicated to a star. He tells us, also, that the Great Pyramid was opened by the Caliph Al Mamoon, but that nothing was found out either as to the motive or time of its construction. The Caliph entered the Pyramid, and advancing, we are told, some twenty cubits, came to a green crypt containing gold coin. He was surprised at the goodness and redness of the money, and found upon calculation that the sum of it amounted exactly to that which he had expended in making the excavations!

We come to modern days, to the time of the French occupation of Egypt, to the great French work on the antiquities of the country, to the most useful work of Colonel Howard Vyse, to the careful drawings of Mr. Perring, and, as we have said, to the photographs of M. Leynard; and we may well ask whether, after so much of learning and study has thus been devoted to these wonderful monuments of human skill, and might, and patience, they are not worth an effort to preserve them from total destruction and oblivion? All things human, it is true, pass away, if time enough be given, and this must be the fate of the Pyramids of Egypt; but it will most surely be to the lasting shame of that time and generation which will look on with indifference at any attempt made to hasten this. And yet one other thought there is here which specially calls for consideration, and that is, that while so very much of what is now done and is doing all the world over in the way of architecture and building, and memorial art, too, which must needs pass away, the world being more or less indifferent to it, these Pyramids, though so simple in idea and outline, make an impression on the minds and art faculties of men which cannot be effaced, and which but very few of man's works have been able to do. How this is might be a very hard question, indeed, to fully answer. But it is so.

We need hardly say how much more might be urged on so momentous a subject thus hastily glanced at; but looking at the present condition of Egypt, and at its monuments and giant remains, not pyramids alone, but at the temples and sculpture and the handwriting of Egypt everywhere visible, we cannot but deplore the neglect on all sides visible. Drawings, photographs, the descriptions and accounts of friends travelling, all alike and equally attest this. To the architect, antiquary, and historian this fact cannot be otherwise than deplorable, and the loss to the world, if things be allowed to go on as they are now going on, must needs be great, and can never be made up for. May we not then ask that something should be done, and that speedily, to avert further mischief?

ISLINGTON IN DAYS SINCE.

Few, perhaps, who hurry along daily amidst the busy throng that are ever to be found in High-street, Islington, realise how short a time has elapsed since that well-known thoroughfare was part of an altogether suburban district. I am not an old man, my grey hairs are few and far between, and yet my early recollections,—for I was born in Islington High-street,—bring to the mind's eye a picture it may be pleasant to recall, as well as some record of other matters more than half-forgotten. My memory takes me back little more than five-and-thirty years; High-street was by no means a row of brilliant shops in those days. Shops there were, certainly, but these were of humble pretensions, well interspersed with many private houses; whilst, in the rear, the whole space right away to the Liverpool-road,—formerly called Back-lane and Back-road,—was open fields. There stood a duck-pond, whereon our ducks swam, and wherein I ducked too! High-street was known as Hedge-row in those days; and between the causeway and the cart-road was a wide and pleasant green sward, and therein many fine elm-trees grew. Unconsciously I have just mentioned the word "causeway," reminding me that before High-street, Islington, was called Hedge-row, it was known as Long Causeway. Upper-street at that time was Town-street, having been altered from King-street, by which it was known in the beginning of the seventeenth century, the name being in commemoration of James I. going along it with great pageant in 1603. It was "Drunken" Barnaby who frequently introduced Islington (in old records called Yselton, Isleton, Eyseldon, Iseudon, and Iseldon). Here is one of his references thereto:—

> "First day, having drunk with many,
> To Islington from London came I;
> Journey long and grievous weather,
> Yet the evening brought me thither,
> Having ta'en my pots by the fier,
> Summer sand was never dryer."

Everybody knows the parish church of St. Mary, Islington. Its foundation-stone was laid in 1751, by Mr. James Colebrook, who owned much property in the adjacent neighbourhood,—Colebrook-row, for instance, amongst the rest, wherein for so many years Charles Lamb and his sister lived. The architect was a Mr. Dowbiggen, who appears to have been an engineer also; for he was a competitor, although an unsuccessful one, for the old Blackfriars Bridge. The builder was Mr. Steemson, and the cost of the church is recorded at 7,340*l.* This goes to show that it was a cheap job, and the usual results followed, for thirty-six years afterwards the building had to be restored, and its tower strengthened. The height of the spire is 164 ft., and the tower contains eight bells. Amongst my old prints, I happen to possess an engraving

of the church that existed prior to the present one, representing it as it appeared the year before it was pulled down. It was a Perpendicular building erected in, I think, 1483, consisting of nave, aisles, and chancel; it had a western embattled tower, in which were six bells, and outside of which was a sun-dial. A quaint little turret rose some 20 ft. above the north-west angle of this tower. The main entrance was by the south porch. The walling of the structure was composed of pebbles, chalk, and flints, so strongly cemented the one with the other that it is recorded that it was only by the use of gunpowder that the old building could be destroyed. There are documents extant proving that a still earlier church stood upon the same spot.

Turning, if I may, from the church to taverns, there are few houses in London better known than the Angel at Islington. The old Angel, pulled down in 1829, is immortalised in Hogarth's print of "A Stage-Coach." This sketch bears the date of 1747. In a lease for a house for Richard Cloudsley from the Prior of St. John of Jerusalem, dated 1516, the Angel is mentioned as being "close by"; and in an indenture dated December 13th, 1700, the same familiar "pub." is thus described:—"All that the messuage, tenement, or inn, commonly called or known by the sign of the Angel, situated, lying, and being in Iselden, alias Islington, in the county of Middlesex; and also all that close or parcel of land in Iseldon, otherwise Islington, aforesaid, lying between the said messuage, tenement, or inn, containing two acres, and also all that house called or known by the name of the sheep-house or sheep-pens, standing and being in Islington upon the said close." All this goes far to show the antiquity of the famous old coaching-house. Islington contained many other hostels, whose names have not altogether died out. The Blue Coat Boy and the Peacock still strive and thrive. The Queen's Head was a most interesting hostelry in old Islington. It was taken down in 1829. Sir Walter Raleigh resided there, and so, according to tradition, did Lord Treasurer Burleigh. It is also said to have been the summer residence of the Earl of Essex, and that Queen Elizabeth frequently visited him there. The Old Pied Bull was an inn that stood by the Green. It existed till some fifty years ago. It was built in Queen Elizabeth's time. This house is also traditionally believed to have been a residence of Sir Walter Raleigh's. It was there, in 1665, that the first victim in Islington died of the plague. He was a gentleman from the City, who, after being refused admission at the Angel, and the White Horse, obtained lodgings at the Old Pied Bull. The next morning he was found dead in bed, having died in the night of the frightful disease. The distemper spread around immediately. Within a week fourteen more people died, and 593 poor souls ultimately succumbed to the pestilence. It was on the common near the Rosemary Branch that, in the latter part of Queen Bess's time, the manly practice of archery having been superseded by artillery, butts were erected for the practice of cannon. At the Saracen's Head, during Bloody Mary's reign, a number of Reformers were betrayed into the hands of the priests. Of these, four poor wretches were burnt to death in Islington. They were fastened to one stake, and died enthusiastically, praying God. It is said that Oliver Cromwell once resided at Holloway, and that the house was afterwards converted into a hostelry, and known as the Crown. Colonel Okey, one of King Charles I.'s judges (he was executed himself after the Restoration), was originally a drayman for an Islington brewery. At the Duke's Head, in Cadd's-row, during the middle of last century, lived Thomas Topham, the famous strong man, who could lift, it is said, 2,000 lb. The Mother Redcap is as old as it is well known, and the Half Moon, another ancient house, was at one time immensely famous for its cheese-cakes. At the Old Parr's Head, at the corner of Cross-street, John Henderson, the great actor, first appeared in public. A very picturesque-gabled wooden structure, shown on old prints as standing at the north-west corner of Islington-green, was called the Fox Public-house. The Old Thatched House Tavern was formerly known as Job's House. It was situated some little distance from the present Thatched House. It is interesting as being the birthplace of Dr. William Hawes, the founder of the Royal Humane Society. He died the beginning of this century, at a good old age, and was buried at St. Mary's, Islington. George Moreland, the celebrated painter, who flourished towards the end of the last century, lived at one time at the Barley Mow, in Frog-lane; and Ball's Pond derives its name from a house of refreshment, famous for bull-baiting, kept by one John Ball. Adjacent to the premises was a large pond, which was at the service of frequenters of his house for duck-hunting, &c. In the immediate neighbourhood of Penton-street stood White Conduit House, attached to which were celebrated tea-gardens. The *Gentleman's Magazine*, in 1760, alludes to them in some capital verses. They conclude thus:—

"So long
As Fashion rides upon the wing of Time,
While tea and cream, and butter'd rolls, can please,
While rival beaux and jealous belles exist,
So long White Conduit House shall be thy fame."

The present White Conduit stands upon a portion of the grounds.

Copenhagen House was famous for its pedestrian matches. It stood in Copenhagen Fields, that is, upon the site of the present Cattle Market. Highbury Barn, originally a wee ale-house, rose to great notoriety as a place of amusement, and then as suddenly went down again. The Sluice House, where, in sylvan-like arbours, one enjoyed eel-pies and other local luxuries at a nominal price, has had its day; and Hornsey Wood House, once another great place, has been shorn of most of the surroundings which were so much its glory in years past, and is fast losing the individuality which, years ago, was so deservedly its own.

The historical memories that Islington recalls to one's remembrance are many and varied. Battle Bridge brings the first, for there it was that Boadicea, the British Queen, and Suetonius Paulinus, fought that great battle which resulted in the terrible defeat of the former. The slaughter was preposterously a one-sided one; for but 400 Romans were killed, whilst the corpses of thousands of Britons were left dead upon the field. From this battle and the bridge just there over the river Fleet the place derived its name. When the Welsh barons, with Llewellyn at their head, came to do homage to King Edward I., they were quartered at Islington. After Henry VI.'s capture in the North, the kingmaker, Warwick, met him at Islington, removed the unfortunate monarch's spurs, and marched him to the Tower. Edward IV. was welcomed at Islington by the Lord Mayor and Corporation of London when he came to take possession of the crown, and in like manner Henry VII. was met by the civic body, after overthrowing Lambert Simnel. Canonbury House is a famous place. It was built for the Priors of St. Bartholomew, and the old tower, some 60 ft. high, which still remains, is, I believe, part of the original structure. Edward VI. granted the manor to John Dudley, Earl of Warwick, afterwards Duke of Northumberland. Later on it was given by Queen Mary to Sir John Spencer. When digging some foundations near the old premises some while ago, the excavators came across an old subterranean passage, which, by common repute, was supposed to have run continuously to the Priory at Smithfield. Anyhow, it was high enough to allow of a full-grown man standing upright in. Queen Elizabeth frequently called upon Sir John Spencer during his residence at Canonbury House. Dr. Oliver Goldsmith is supposed to have written some of his works in its old tower. The unfortunate Earl of Essex passed through Islington on his way, with a brilliant train of noblemen, to quell the rebellion in Ireland. Poor fellow! shortly after his return he was himself executed. In 1616 Charles I. caused a battery to be erected at Mount Hill, and another near Islington Pound. In the Middle Ages, Islington was quite an ecclesiastical territory, for at least four-fifths of it were owned by the clergy. The Knights Hospitallers of St. John of Jerusalem were amongst these, and they held the land until the time of the dissolution of the order.

The New River, commenced in 1609 and completed in 1613, is a mighty work, altogether due to the earnestness of Sir Hugh Myddelton, its sole founder and projector. Years after, in 1809, the company having failed to supply the inhabitants of Holloway with water, Mr. George Pocock (grandfather, I believe, of Mr. Pocock, the well-known architect of Craven-street, Strand) sank a great well there, at an expense of about 2,000*l.*, and worked it for the inhabitants' benefit by a steam-engine. This brought the New River Company to their senses, and they brought pipes through Islington, and watered the valley of Holloway to its heart's content. Collins, the poet; Baron d'Aguilar, the miser, who died worth 200,000*l.*; Alexander Cruden, the compiler of the Concordance to the Bible; William Woodfall, the great Parliamentary reporter; Abraham Newland, chief cashier of the Bank of England 100 years ago; Charles Blount, Justice Hyde, and many others whose names are familiar to the ordinary reader, lived at Islington. Henry Carey, afterwards Lord Hunsden, Queen Elizabeth's favourite cousin, resided at Hunsden House, Islington, a building pulled down in 1800. Sir Henry Yelverton, a judge in Charles I.'s reign, was baptised at its parish church; and Defoe, although born in St. Giles's (his father was a butcher), went to school at Islington.

All this, and much else of the same sort of thing, I was pondering over, when suddenly a familiar voice at my elbow cried,—"If you want the Islington tram, here you are!" Dear me, how *things have* changed, to be sure!

HARRY HEMS.

THE POLYCHROMATIC DECORATION OF VARIOUS BUILDINGS.*

ROYAL INSTITUTE OF BRITISH ARCHITECTS.

I DO not intend to treat this subject, on the present occasion, *ab initio*, as our Transactions already contain some really able and elaborate papers upon polychromy, by writers of acknowledged authority with respect to it. My present object is to bring forward, for the purpose of consideration and discussion, some broad general principles which should, I think, guide our practice as to the application of colour more than, as it appears to me, they have hitherto done.

So long as architecture was a living, original, and progressive art, the use of colour was both universal and profuse in all countries and all climates. Nature, likewise, seems to abhor absence of colour as she is said to do a vacuum. No sooner does the annual coat of whitewash render glaring walls and roof alike of the Welsh cottage, than she sets to work to convert it into a "harmony in greys" or some other delicate tints; and she soon mantles over with rich lichens and mosses the freshly-scarped side of a quarry or the garish slope of a railway cutting. The application of colour to architecture during the whole period to which I have referred, by every nation in succession, was simple, vigorous, judicious, and, in fine, right; almost as certainly so as it is in each landscape, beast, bird, or flower that we see around us.

But the "Renaissance," as it was called, of the dead languages of art at the close of the fifteenth century in Italy, turned architecture into a system of copyism, a compilation by the learned, an amusement for the *dilettanti*. Then all principles as to the application of colour to buildings seemed, as it were, to evaporate. The practice of it became a matter of mere individual taste; guided, it is true, for some time by artists of consummate talent, such as Raffaelle, his compeers, and immediate successors. Afterwards, however, as art became corrupted, this department of it fell under the caprice which individual want of taste might dictate. The result now is that in Italy the colouring flaunted outside its villas is shocking to every refined eye; while in England, safety has been more wisely sought in ignominious flight, and negation of colour altogether has come to be accepted as the *ne plus ultra* of educated and refined taste. Yet, even down to the present day, in the far East, whither the Renaissance has hardly penetrated, and had happily but slight effect, the old healthy natural feeling for colour survives; and it may continue to do so until Manchester cotton goods, and the efforts of Europeans to teach the Oriental cockney villa building, succeed in effectually stifling it.

The contents of our Indian museums and South Kensington loan collections show us that the unsophisticated natural instinct of mankind for colour is just and true, and that the practice of it, unbiassed by false theory, can be and has been handed down from generation to generation with faultless accuracy. It is obvious, therefore, from the briefest survey of Nature and past art, that there must be some principles which could and should guide us, if we could only re-discover them. And the possibility of contributing in any degree to so desirable an end has been the main motive for my having brought this subject before you.

In consequence of the unfortunate perish-

* From a paper read by Mr. John Pollard Seddon, Fellow, on Monday evening last, as elsewhere mentioned.

ability of polychromatic decorations, we know but very little as to what the artistically-gifted nation of the Greeks thought and did with respect to it. We have but recently come to the conclusion that, far from eschewing it, as our purist fathers fancied that they did, they, in fact, actually revelled in it. If we could but glean sufficient and reliable precedents from their works, we might save ourselves the trouble of endeavouring to concoct any theories of our own upon the subject, and content ourselves with accepting their practice as perfection, in the same manner as we recognise it to have been, so far as their aim extended, both in architecture and sculpture. It is perhaps, therefore, fortunate that we have escaped becoming entangled in such leading-strings in this department of art, considering how different the circumstances under which they worked were from our own. It certainly is so, if the crude tints given in some published illustrations as representative of what has been discovered of the colours employed upon Greek buildings had authority in fact. A glimpse has been obtained here and there upon a few marble fragments that analysts tell us was cobalt, and lithographers have straightway been set to work to give us pure cobalt with a vengeance, and thence it has been assumed that the Hellenic polychromy must have been what we feel we could not ourselves digest, and had therefore much better avoid; and so but a little knowledge has become a dangerous thing.

Perhaps the following extract from Professor Symond's "Sketches in Greece and Italy" gives as good an idea as can now be obtained of what the Greek system of coloured decoration really was:—

"To realise by fancy the many-coloured radiance of the temples and the rich dresses of the votaries, illuminated by the sharp light of a Greek sun, which deprives outline of shadow, and gives value to the faintest hue, would be impossible. All that we can know positively about the chromatic decoration of the Greeks is that whiteness, artifically subdued to the tone of ivory, prevailed throughout the stonework of the buildings; while blue and green, in distinct, yet interwoven, patterns, added richness to the fretwork and the sculpture of pediment and frieze. The sacramental robes of the worshippers accorded doubtless with the general harmony, wherein colour was subordinate to light, and light was toned to softness."

But time need not be lost in speculations as to what may have been the practice in Classical times; and we can assert in passing, without lengthened comment, that Egyptians, Assyrians, Persepolitans, Indians, and Chinese, all alike decked their buildings, without and within, with bright and yet harmonious colouring; and when we turn to the Eastern productions of the present day, we find, still universally, refinement and harmony both in the colours used and in the manner of combining and applying them. The evidences and remains that we possess of the polychromy of the Ancients and of the Oriental world may be taken as certain testimony of the sense held therein as to the absolute necessity of the employment of colour, as the proper completion of works of architecture, and also of the acknowledgment of its power.

What then, we may well ask, is that power? As an answer to this question, I venture to quote from some valuable notes on this subject, lent me some time since by Mr. Henry Conybeare, and to which I am also considerably indebted for several suggestions incorporated in this paper:—

"Polychromy in architecture can either increase or diminish the apparent scale of an interior; it can render it light or obscure; it can alter its proportions or accentuate them; it can produce the effect of distance or of approximation; it can amuse or fatigue; it can conceal defects or exaggerate them; it is a fairy who is prodigal either of good or evil, but who is never neutral; at her will she thickens columns or attenuates them; she heightens pillars or lowers them; she elevates the vaulted roof, or brings it down nearer to the eye; she enlarges surfaces, or diminishes them; charms or offends; concentrates the thoughts upon one idea, or distracts and preoccupies them without cause; with a stroke of a brush she destroys a work that has been wisely conceived, yet at the same time she can convert the humblest edifice into a work of art full of attraction; she can change the coldest and most naked interior into a pleasant place where one loves to dream, and of which one preserves an ineffaceable remembrance."

It is, in fact, an instrument of such tremendous power, that, while one searches anxiously, and, as it were, lovingly, for all traces of its use upon works of old, one is inclined to shudder when one sees it grasped by the hands of a contemporary. And why should we be able to trust so implicitly in the one case and yet be so faithless in the other? Because the artists of old acted according to a system founded upon experience and common sense; and the decorator of to-day, acts according to no system, but on experiment, and to please his own individual taste. In the former case success could be predicted, and in the latter, failure, as the more than probable result.

The isolation of the several branches of art has destroyed the strength that they once possessed from combination, just as the fabled bundle of sticks became powerless, when separated, to resist the force which had failed to break it when united.

Polychromy, which absolutely requires complete understanding between the designer of the building and of the decorations, so that one mind or at least minds of the same order should direct and control both, has become entirely unsystematic and a matter of mere individual caprice. The consequence of which is that the public are quite at sea as to whom they ought to entrust work of this character. So long as it is a question of a building of any importance, it is the usual custom to seek the assistance of members of the architectural profession, and they are then expected to find builders to execute their designs. But when it comes to the painted window to be inserted into the same building, or decorations to be applied, architects are naïvely asked what tradesmen they would recommend for the purpose; and should they reply, as would be but reasonable, with the advice that such work should be entrusted to themselves, or some other discreet and learned member of their own profession, the advice would be received with incredulous amazement, and, in nine cases out of ten, not followed.

The existence of such a state of things, which is in no degree exaggerated, is of serious effect to our profession, and needs the utmost consideration; but what is of far more importance, it is of vital interest to the public, as the result of such things now is simply disastrous and destructive of their taste and good sense. Our cathedrals and churches throughout the country have by this means been turned into museums for the display of the most execrable parodies of art, which have produced colour blindness, and, I might almost say, atrophy of intellect in the nation at large.

It is but a few weeks since that a clerical friend of mine promised me, as a treat, the inspection of his church in the suburb of a large town, boasting that every window of it was filled with good painted glass. As I knew him to be a man of more than usual cultivation and refinement, I hoped, almost against hope, that something better than ordinary would be shown me. Alas, on entering the church, I could not help doubting the sanity of a congregation that could sit facing so constantly daubs of so wretched a description. The real truth is that people do not look at painted windows in any fashion, not to say critically, nor even observantly, otherwise they could not endure the glaring colours and grotesquely bad drawing that they would scout in the cheapest lithograph. They are content if patches of bright light and colour are thrown athwart the walls and pavement and produce a generally brilliant effect which is due to the light and not the artist (forgive the misappropriation of the name) by whom the work was executed.

But we need not travel so far for examples, when our own glorious Westminster Abbey is disfigured in like manner, and its scale diminished by the colossal size of the figures in the modern windows in the clearstory.*

And with regard to modern buildings, we all know and deplore the costly fiascos which are of constant occurrence, whenever anything out of the ordinary routine, and even within the ordinary routine, is attempted; when the office of the architect to decorate his own building, which he has designed to produce certain effects, has been usurped by men untrained to know even the use and purport of architectural features, and who look upon walls as they would upon canvasses, as mere space whereon to indulge the wildest imaginations. Unfortunately, architects, as a rule, are not credited, by the world in general, with being competent to undertake this branch of their art. Dare I make the suggestion, even in this august assembly of the profession, that all architects are not so, and that there is some ground for this rather widely-spread opinion? At any rate, I fear we must admit that we have not any definite and recognised system among us by which we can ensure a right result, and that our practice is founded rather upon our own individual taste and fancies, which we have no right to impose upon the public as possessing indisputable authority.

Then, as to our painters and sculptors, whose artistic powers are far greater than our own, and who have achieved world-wide reputations, it may seem bold on my part to deny that they are fit to be entrusted with the decoration of buildings. Yet I do so emphatically. I fully believe that if they would work in concert with architects, they would succeed. But, as a rule, they are wholly ignorant of architecture, and practically, if not theoretically, despise it. They are intolerant of the necessary conditions and limitations of true decorative painting. They cannot use restraint as regards foreshortening, perspective, and aërial effects. Their nearest attempts to what is wanted are but gigantic pictures which need to be enclosed with frames, and so framed off, as it were, and separated and made distinct from the buildings they are supposed to decorate; and where this has not been done, they have resolved the walls appropriated to their work into empty space, and, so far as their work has extended, have ruined the buildings. The few attempts made by eminent painters in designing stained glass have been great failures, from Sir Joshua Reynolds downwards. In fact, the pictures and statues of our noble English school of painters and sculptors are admirable so long as they are confined to their frames and their pedestals, but are an offence when intruded into buildings with which they have no necessary connexion.

Of late it seems to have been thought that architectural decoration is the special province of a few amateurs and trade decorators. In the case of St. Paul's Cathedral, and in other instances, at the advice of amateurs, decoration has been taken out of the hands of architects to be handed over into those of painters, to carry out, with certain modifications, the design of a sculptor, which I have no hesitation in pronouncing to be, as it is presented to us, thoroughly unsuitable for the purpose. In other cases, again at the instance of amateurs, works of this character have been entrusted to decorators who have been trained by and gained their position through architects, but who do not hesitate now to supersede them; and though the results may have a certain superficially correct effect, are wholly destitute of artistic feeling, and can only be counted as fine opportunities spoilt. It would matter little or nothing to the public who the parties to be engaged on such work should be, so long as they were found to be competent. Whether architects now be so or not, I think it is capable of proof that they only can become so, and that neither painters nor decorators without them ever can be. But I pass from these remarks, which I have felt called upon to make, unpalatable though I know they must be to some, to try to show the remedy for the evils I have been pointing out and deploring.

And where are we to seek it? Classical precedents being, as already pointed out, mainly conspicuous for their absence, we are almost compelled to fall back upon Mediæval precedents, and, fortunately, we shall not have to seek in vain. We shall not be able to discover the names of any great masters to whom even the *chefs-d'œuvre* of the polychromy of the Middle Ages are due; for it was not occasionally, here and there only, that success was attained, while failure or uninteresting mediocrity was stamped upon the majority of the attempts made; all seemed alike excellent and in good taste. We can, it is true, discern various degrees of merit, and sometimes of demerit, in the manner of drawing the figures introduced into the general scheme of coloured decoration; but the scheme itself and the character of its treatment were almost invariably good, and the colouring harmonious. We may roam through scores of out-of-the-way villages in Norfolk, and find in them church after church filled with mutilated fragments of richly-painted rood-screens. All of these are exquisite in design, charming in colour, and covered with most delicate and refined ornamentation. There *is* in the Institute library a volume of highly-finished tracings from drawings made in some of these churches by Mr. Wardell, presented, at my request, by the late Sir William Tite, which may be studied with advantage. There are also monographs, by Mr. Winter, of the fine screens in Randsworth and Barton Turf Churches in Norfolk, in our collection, which convey a good idea of them. On the panels of these screens there are numerous painted

* The old windows in the clearstory of the apse have the figures in them of the proper scale, which was always adopted in the Middle Ages, viz., less than life size.

figures of angels and saints, which are all good in general conception, and the draperies are ably drawn and designed in excellent style; while the heads, hands, and feet vary much in point of merit. In some cases heads (as at Barton Turf) may be found quite rivalling, while differing from, the productions of the early Italian school; and yet the extremities of the limbs of the same figures are uncouth even to grotesqueness. This fact proves the existence of an admirable system, by means of which decoration of a high order could be carried out, and good effects produced, mainly by common workmen, at a very moderate cost, and under ordinary circumstance,—a great desideratum at the present day. We may see the results of a like system if we take up a set of Chinese plates, in which we shall find upon close examination that, although the general design throughout the set corresponds, the decorative effect being right in all, yet that the drawing and finish of the separate details vary considerably, one or a few out of the whole number being noticeably superior to the rest. The obvious conclusion thence is that a master-hand set out the work, and that pupils or under-workmen completed the others from the pattern given them, and that some system has been conformed to which has prevented any of the workers from travelling out of the right groove. That remnants of such a system in connexion with coloured decorations still exist may be inferred from a statement made in Carzon's "Monasteries of the Levant." That author relates that, having to visit some church at Mount Athos, he saw its whole interior decorated in an almost incredibly short space of time (some few hours) by a master painter, accompanied by several pupils, each armed with a different appliance. The master drew in the outlines of the historical subject to be represented, and his pupils followed, and in succession filled in with brushes, from pots of pigments of different colours, the portions of the several figures or of the background, as evidently determined beforehand. All obviously knew exactly what they had to do, and did it, without waste of time in experiments. The result was, as may have have been expected, conventional and stiff, yet the general effect was good and harmonious.

There are several churches in Norway which still retain, nearly intact, the whole of their original Mediæval coloured decorations. These have been fully and well illustrated in a work by M. Mandelgren, a copy of which is, I believe, in the Institute Library. This is worthy of particular attention by all students of polychromy, and it is, besides, a mine of information upon the iconography of Christian art. It shows the system adopted in the Middle Ages, and its adaptation to buildings of quite a humble character, and that with a degree of completeness which it is almost hopeless to expect to find in any of the larger and more important buildings of Christendom, which have been more exposed to destructive agencies. There are, however, many scattered examples of polychromatic decorations in England and upon the Continent, now tolerably well known, which it would be tedious to enumerate. I shall refer only to a few in detail, as typical among them, and in order, if possible, to gather from them some idea of the system under which they were produced.

The principal object with which the simple coloured decorations of the early Mediæval periods, known in England as Norman and Transitional, were applied, was in order to emphasise, make distinct and clear, the constructive parts of a building. These, it must be remembered, were very simple in themselves, consisting of broad spaces, with few and bold but not deep mouldings. Breadth in colouring was, therefore, appropriate to this architecture. Projecting parts were accentuated by light warm tints, and hollows by dark and retiring and cooler ones. Stencilled borders were employed to throw up cornices, strings, and vaulting ribs. The plain spaces of walling were made to appear solid and flat by decorations consisting of lines, suggesting but not directly imitating construction, together with other unobtrusive ornaments, such as diapering, with panels inclosed with borders for occasional pictures or figures, almost equally simple and conventional in character.

The pigments employed in these early works were few and simple, and their medium merely size (that is, they were *tempera* paintings), and they could not fail to harmonise agreeably. The earth colours, red and yellow ochre, black and white, with a quiet-toned slaty blue, formed the moderate but sufficiently comprehensive palette for the purpose required, for the red mixed with black made chocolate, and with white formed rose; the yellow with black or with blue gave greens, and with a white creamy tint; then the black and blue mixed with white gave various greys. It is astonishing what variety can be obtained with these few simple colours and by judicious contrasts of warm with cool tints, and of dark with light. Mr. James K. Colling, in his "Art Foliage," pleads, as I would plead, for a far more extended scale of colour, and calls attention to the numerous shades intermediate between the primaries to be found in nature; but my advice is to the student, at any rate, to commence and be content with the simple system until complete mastery has been obtained over it. In fact, to follow the safe example set us by our Mediæval ancestors, of making sure of each step taken in advance in succession, rather than to adopt the lawless licence introduced with the Renaissance, which needs genius and talent of the highest order, and not always at command, to control it; and which has led our ordinary decorators into a slough of despond from which they are unable to extricate themselves,—the multitude of ill-assorted and uncongenial colours with which they attempt to deal only serving to embarrass them.*

THE DÜSSELDORF EXHIBITION.

IT appears as if the Düsseldorf Exhibition is to differ from its predecessors in so far also that it will be completely ready at the time of its opening, fixed for May 9th. The buildings are already finished, the whole making the impression of a small idyllic town on the "Happy Islands,"—so beautifully, airily, and lightly are the numerous annexes and pavilions grouped between forest and water (the Rhine) round the principal structure. It may be said that the space which the Exhibition buildings, as now completed, cover is about a third larger in area than it was expected at first would be required for them. At the last Berlin Industrial Exhibition the space covered by buildings was 6 acres; in Düsseldorf 10 acres are roofed in; and while in Berlin the whole Exhibition area was 15 acres, that of Düsseldorf measures over 50 acres.

In order to give an idea of the extent, and to enable an estimate to be formed of the value, of the approaching Düsseldorf Exhibition, it may be mentioned that, irrespective of the buildings, the objects to be exhibited have been insured for 500,000*l.*,—not a small sum for a provincial exhibition. Sixteen insurance-offices have taken the risk.

In the competition for the design of a diploma, that of Herr Hartung, an architect of Berlin, has been accepted; the first prize for the designing of the medal to be distributed to successful exhibitors, having been awarded to Professor A. Schmitz, of Düsseldorf.

The interior decoration of the principal building is very far advanced. The various groups are kept uniform. The exhibition already attracts many visitors, the busy activity of the numerous workmen being the object of keen interest. In the machinery-hall, the travelling crane, capable of lifting 20 tons, is constantly at work, the mounting of boilers, engines, and machinery being attentively watched by the assembled public. The airy structure of the hall does not at all appear capable of supporting such heavy weights as are imposed upon its beams and girders. The larger articles are brought by rail right into the hall, junctions having been effected with the three railways passing Düsseldorf, of course, at present, only for goods. It was believed at first that it would be possible to find room for the exhibition of railway-carriages in the principal building by the side of the machinery-hall; but the applications for those two spaces being so very numerous, at the last moment a separate hall had to be raised for the exhibition of carriages.

In the art section, to which the best rooms of the exhibition have been given, the hanging committee are busily at work. The number of pictures continually arriving for which space was applied for is so large as to sorely puzzle the generous-minded among the jury how to hang to the greatest advantage many a deserving work. German artists may congratulate themselves in having found in Herr H. Lueg, the president and principal promoter of the Düsseldorf Exhibition, a gentleman who enabled them to have a fourth collective exhibition of their works, which promises to be in every way brilliant and successful. This is, again, a matter of congratulation for the industrial part of the exhibition, for the art section is sure to prove a great power of attraction, and thus the financial success of the whole is assured.

The whole extensive area of the exhibition will be lighted up in the evening by fifteen electric lamps. A special building is being erected for the dynamo-electric machines.

* To be continued.

MODERN JAPAN.

MRS. BRASSEY'S advice that "travellers who wish to see Japan should do so at once, for the country is changing every day, and in three years more will be so Europeanised that little will be left worth seeing," would seem, written as it was three years ago, almost to have been justified by the accounts which reach us from time to time of those once-distant islands, which the discoveries of Professor Nordenskjöld promise to bring in even closer communication with our shores. Modern Japan has been much written about, and the interest it arouses never lessens; but the advance is so rapid that only the latest information from the land of Fujeyama can picture the condition of its progress. The organ of the Oriental Museum at Vienna, the *Monthly Review of the East*, takes from the Japanese journals some curious details on the ingenious industry of the country. The imitative talent of the Japanese, it would appear, is truly remarkable,—Mrs. Brassey, it will be remembered, had made the same observation,—and this talent they exercise to a degree which is positively amusing. This power, which the Japanese possess in common with their Mongol brethren of the West, the Chinese, is especially shown in a series of copies,—*facsimiles* rather,—of everything that is foreign, from Swedish matches to the most facile of modern European civilised manners. In the matter of the matches, the Japanese have already succeeded in entirely driving out of the market the genuine *Tandstickors*, and what they produce is, it appears, of such excellent quality, that the precaution taken by some manufacturers to place on their products foreign labels is entirely superfluous.

Among the various other articles successfully imitated by the Japanese is Cognac. But the Government appears by no means disposed to authorise the frauds of this nature, and lately an individual convicted of deception in this matter was punished with sixty lashes. At Osaka and Sakaï, the Japanese Sheffield, it appears that strong boxes and incombustible safes are manufactured, bearing the false name of European houses and the British arms. At Hiogo, also, this branch of manufacture is very active, and the products of a well-known firm are successfully imitated.

The progress made by the Japanese in legitimate trade is attested by the following fact borrowed from the *Otsu-sinpo*:—Last year two silk manufacturers sent to Europe a sample of seven rolls of Japanese crape, 52 ft. long and some 3 ft. broad; in Japan the value of this crape would have been 480 yen, or dollars; in Europe the profit they gained on the sale was 1,200 yen, or, deduction made for expenses, 870 yen. This success has induced the two manufacturers to export this article to Europe on a vast scale.

The same Japanese journal furnishes some interesting information respecting the fabrication of fans. Here, as in many other branches of industry, the principle of the division of labour is rigorously observed. The bamboo-sticks are prepared by workmen in their own homes, while the incised ornaments of the lower portion of the fan are confided to more skilful hands, who dress the handles according to the sketches given by the designer. In the same way, the artist gives to the engraver the motives which in his idea will prevail the next season, and will ensure a ready sale. He it is also who chooses the colours for the pieces already cut out, as also the colours for each isolated detail, and, finally, the different decorations for the back of the fan. The paper made use of to insert, when pasted, the leaves of the fan is all Japanese; it is peculiarly suited for this purpose,—so much so that an

attempt to employ foreign paper had to be abandoned. The papers from America were tried, but rejected; but experts will tell one that the native paper used in this branch of industry is much inferior to that used in the past. Formerly, when the country had no relations with the outer world, the most expensive fan made cost scarcely a pound. Since then, however, there have been numerous commissions for much larger sums. The current price of ordinary fans is, for a hundred, from 50 yen or dollars to 15 yen. The number of fans furnished for the Philadelphia Exhibition of 1876, on commission, was no fewer than 800,000, the price of which was estimated at 50,000 dollars, 10,000*l*. Formerly the fan trade rarely exceeded 10,000 articles yearly throughout the whole country, but during the last twelve months,—though the date from which this period commences is not stated by our informant,—there have been exported nearly three millions of articles from Hiogo and Yokohama. Highly appreciated as are the products of Hiogo, those of Tokio are by far the most esteemed, not alone for their beauty, but for their superior cheapness.

BUILDINGS FOR SECONDARY EDUCATIONAL PURPOSES.*

IT has long been the meritorious privilege of this Society to inaugurate valuable reforms in social and political economy, and to materially aid in the development of educational, industrial, and commercial enterprise. It is here that the enthusiast, charged with some fixed idea as to the particular mode by which improvements may be effected in any time-honoured custom, or antiquated system of doing or thinking, may deliver himself of his crotchet, and bring to the test of discussion the result of his lucubrations. The earnestness and honesty with which opinions may be stated are sure of appreciation here, even though the convictions themselves do not find approval, and, therefore it is that one feels free to speak one's mind in this room without let or hindrance, knowing well that the wheat will be separated from the chaff by the interchange of ideas, and progress of a more or less substantial character will result from the consideration of the questions at issue.

Upon the subject before us to-night an immense variety of opinion has existed, and still exists, and it is no purpose of mine to claim exceptional superiority to, or even exemption from, the weaknesses of others. Nor shall I stay to magnify their deficiencies, but rather try to add what I may towards the solution of a problem which is every day becoming more interesting as its importance is more keenly felt.

The inconsistency subsisting at the present time with reference to the supervision and control of educational buildings will be obvious to all whose attention has once been drawn to it. While in elementary schools, workhouses, and lunatic asylums, restrictions are imposed, and rules and regulations are enforced, which prescribe the minimum superficial area and cubical space to be allotted to each inmate, in secondary and higher class school buildings no such supervision exists, and the middle and upper class boys and girls of the period are allowed to be packed away in close, ill-ventilated, badly-arranged apartments, without any controlling authority, in premises not originally constructed for educational purposes, and with none of the appliances common to every Board school. A private house, originally intended for the accommodation of less than a dozen persons, is seized upon for a middle-class school for several hundred pupils.

Properly-certificated teachers are demanded for primary tuition, but any speculative person, whether certificated or not, may establish a secondary school; and no minister of education may interfere with the glorious independence of the bold Briton who, perchance, may add to his intellectual incapacity entire ignorance of sanitary laws, and the consequent effect of which, upon the physical and mental vigour of his pupils, however deleterious, passes unchallenged. Mr. Matthew Arnold has well said:—"The middle classes in England have every reason not to rest content with their private schools; the State can do a great deal better for them. By giving to schools for these classes a public character, it can bring the instruction in these under a criticism which the knowledge of these classes is not in itself at present able to supply: thus, the middle classes might, by the aid of the State, better their instruction, while still keeping its cost moderate. This in itself would be a gain, but this gain would be nothing in comparison with that of acquiring the sense of belonging to great and honourable seats of learning, and of breathing in their youth the air of the best culture of their nation. This sense would be an educational influence for them of the highest value; it would really augment their self-respect and moral force; it would truly fuse them with the class above, and tend to bring about for them the equality they desire."

How this desirable end may be brought about it concerns us all to inquire. I can do no more on the present occasion than call attention to it, in the hope that it may yet receive the consideration it demands from a patriotic people.

The recent growth of intelligence in the design and construction of national schools and their appliances is too obvious to need more than a passing remark when comparison is made between the latest efforts of the London School Board and the system which preceded it. The effect of this improvement is, however, beginning to be felt in secondary schools; and its influence will be still more marked in the future, as time rolls on, and the necessity for the same constructional advantages is better understood and appreciated. Humble as yet may be the educational results of the London School Board curriculum beyond the three R's, the social and moral influences of their ample provision of space, suitable fittings, and sanitary arrangements, cannot be otherwise than considerable.

The older educational endowments for higher education are associated with buildings erected at a period when sanitary laws were little understood. As Mr. Robson observes:—"Our old foundation grammar-schools furnish us with few ideas as to the future planning of public middle schools; their sole provision was usually a single, lofty, and noble hall of oblong form, in which the whole of the boys might be seen engaged in their various lessons, learning by "art," or carefully plodding with grammar and dictionary within sight of the master, who was placed on a raised platform. No class-room ever, until quite recent years, spoiled the simple dignity of these architecturally excellent schoolhouses, and their fittings were of the rudest and simplest kind." Through the action of the Endowment Commissioners many of these old institutions are being remodelled, and schemes for their wider use and development are constantly being thought out, as new buildings are required to meet the increasing demands for space. Opportunity is thus occasionally given to exercise the ingenuity, which has been so well displayed in primary school-houses, on middle-class school-buildings. Private schools in particular, as we have already observed, usually suffer from the disadvantages of being located in houses not specially constructed for them. Public schools will inevitably become more and more popular as the teaching power improves, and as the opportunity for proper classification,—which is increased with the larger numbers to be taught in one and the same building,—is recognised. Public schools for boys have always been more or less in vogue, but public schools for girls are a modern innovation, calling for special contrivance in the buildings appointed for their use.

Concerning public day-schools for girls, and with respect to their suitability for the purposes contemplated, Miss Wolstenholme emphatically says:—"The experiment of large day-schools has been successfully tried, and the results are conclusive as to the superiority of the system from whatever point of view we regard it; their superior economy is obvious. Morally, we believe the gain to be also great. We want in every considerable town in England a high school for girls, which should offer the best possible education on moderate terms,—one which should serve as a model to all those private establishments for which in future, as at present, there will no doubt be abundant room. To such a school as this it would be very easy to attach all manner of appliances and apparatus in the way of lectures and special classes, which might be attended from private families or smaller schools."

Since these words were penned, eighteen schools for girls have been established by the Girls' Public Day-Schools Company, originated by Mrs. Gray, who sagaciously hit upon this commercial means of extending this new system of education for girls, but which is equally applicable to boys; and a Boys' Public Day-schools Company would not fail to achieve a similar success. The resources of the company have, as yet, been chiefly employed in the establishment of new schools, and they have been obliged to hire houses for school buildings. Except at Croydon and Blackheath,* which are very creditable examples, I am not aware that they have erected any new schools. At Gateshead and Oxford new schools are projected. I am, myself, engaged in the preparation of plans for a new school-house for the St. John's-wood branch, of which I was one of the original promoters, and in which I am desirous of giving an inexpensive illustration of the principles hereafter advocated, adapted to a school for 300 pupils. The system of teaching adopted in these schools is very similar to that elaborated at one which may be regarded as the mother of girls' day-schools, viz., the North London Collegiate and Camden School for Girls, founded by Miss Buss nearly thirty years ago. The remarkable success of these day-schools is proverbial. They now contain nearly 1,000 pupils, several hundreds more patiently awaiting their turn for admission as vacancies occur. On the application of the Brewers' Company, the Charity Commissioners projected a scheme whereby certain valuable educational endowments, belonging to that company and the Clothworkers' Company, have been devoted to the development of these schools, thus enabling the trustees, to whom Miss Buss had handed them over, to erect, for her foundation, representative buildings of their class. As the architect to the trustees for carrying on the said day-schools, I shall have occasion to point out the peculiarities of their construction. With these preliminary remarks, I now proceed to offer some practical suggestions, with the view of popularising a subject not generally too well understood. It may be convenient if I arrange what I wish to say under two general heads:—

1. The general arrangement of the buildings as a whole.
2. The particular planning of the parts.

PART I.

We will take it for granted, if you please, that the site is all we could desire, with a hard gravel subsoil, slightly elevated, well drained, surrounded by playgrounds, chiefly extended towards the sunny side, the aspect being such that a few northern-lighted rooms may be obtained for artistic purposes; but the main class-rooms to be east-by-south or west-by-north, that they may not be too cold in winter nor too warm in summer, and may at all times be bright and cheery. The class-room windows to be not less than 50 ft. from any opposite buildings, and their area of light of not less than one-fourth of the floor space, and, if the windows are on one side wall, the opposite wall should not be more than 25 ft. distant, so that the farthest desk may have sufficient light; 15 ft. square is the maximum area required for each pupil, and 14 ft. a maximum height; the minimum area should be 12 ft. square, and 12 ft. in height. Inlets for fresh air should be opposite the foul-air extracts, arranged for use in the varying proportions required in summer and winter, and entirely under the control of the teacher; some, at least, of the extract shafts to be heated at the base, and some, at least, of the inlets for fresh air to be capable of being warmed on its passage into the room. However contracted the site, it is to be hoped that room will be found for a fives-court and for the simpler kind of gymnastic exercises, both covered and uncovered. With reference to the general arrangement of school-buildings, they naturally divide themselves into two distinct classes, viz., boarding-schools and day-schools.

Boarding-Schools.—With reference to the first, it is not my intention to say very much, because it is not in this direction that the extension of educational buildings is likely to be so very greatly increased; nevertheless, it is very important that the improvements made in day-schools should be imported into boarding-schools, and the accommodation required for residentiary purposes should not overbear or prejudicially influence the educational department and appliances. It has been one of the drawbacks to the proper development of voluntary schools that the promoters were too often willing to sacrifice the school conveniences for the sake of obtaining space for popular lectures and general assembly-

* By Mr. E. C. Robins, F.S.A. Read at the Society of Arts on the 7th inst.

* Illustrations of the Blackheath School will be found in the *Builder*, p. 410, *ante*.

rooms, and the Education Department very properly set their faces against innovations of this sort wherever their influence extended. At the same time, the great cost of extensive dormitories and domestic offices in boarding-schools renders it essentially necessary to bear in mind the double purpose of such buildings, so that each may be economically arranged and the provisions necessary for the one purpose may not lead either to curtailment or extension beyond the requirements of the other. As an example of the kind of building which, in practice, has been found to answer the ends proposed, I will draw your attention to the plans on the walls, which illustrate Milton-mount College, Gravesend. The educational division of the building occupies the ground-floor of the main block, consisting of a southern front and eastern and western wings, over which are two stories of dormitories; the dining-hall—a single-story building, with an open-timbered roof—is situated in the centre, and is placed at right angles with the main building, and, being situated immediately opposite the entrance-hall, is easily accessible for public uses or school lectures and examinations, while at the other and northern end are the kitchen offices, quite distinct from the rest of the building, yet closely associated therewith by the corridor running on the side of the hall. The pupils' staircases occupy the internal angles at the junction of the main building with the wings, while in the centre is a service staircase, at the southern end of the corridor, connecting the main building with the domestic offices. By this arrangement, the several parts of the building are in close connexion and yet perfectly distinct:—The educational apartments, with the teachers' and pupils' dormitories above them; the kitchen-offices with the servants' dormitories over them; and the dining and lecture hall between.

The architect of the London School Board, Mr. E. R. Robson, F.S.A., in his admirable work on school architecture, has chosen this building as an example of a middle-class boarding-school, and has given four illustrations of it. I cannot do better than to quote his succinct description. He says:—"Milton-mount College, Gravesend, intended for the daughters of Congregational ministers, and erected from the designs of Mr. Robins, forms a rare specimen of a carefully-considered schoolhouse for 150 girls on the boarding principle. The sleeping apartments on the first-floor are planned on the model of the ancient monastic dormitories, a central corridor down a large hall or room, leading, on right and left, to cells, chambers, or cubicles, formed by wooden-panelled or match-boarded partitions, 6 ft. 6 in. high, arranged along both sides. The monks' dormitory at Durham, erected in the fifteenth century, and now used as a library, was identical with this in plan. The advantage of the arrangement is that each scholar has a room to herself, while ventilation is promoted by the upper part of the room being entirely unencumbered by divisions. The cubicles measure 9 ft. 6 in. by 5 ft. 6 in., and occasionally two are thrown together, by the omission of the partition, for occupation by two sisters or friends. A drawing shows an interior view, supposing the partition removed for the purposes of a sketch. On the ground-floor are the school-rooms, class-rooms, teachers' and visitors' rooms, library and music-rooms; the last are fitted with shelves and portfolio lockers. The little practising-rooms contain each a piano, and it is found that sound from room to room is sufficiently deadened by the plan for the purpose in view. In each of the schoolrooms book-closets are formed against the wall-dado, and surround the room. One school-room is fitted with a raised gallery and Dr. Liebreich's desks; there are four class-rooms, each for twenty pupils; the bonnet and cloak-rooms are fitted with separate closets for every three girls; the dining-hall is capable of accommodating 150 girls and eight mistresses. The arrangements of the dormitories on the second-floor are identical with those of the first-floor."

Now there is nothing in the design of this building which would not make it equally suitable for boys, excepting only the music-rooms, which might be converted into science class-rooms. The same may be said of another example of this description of building, viz., the Educational Home for the Daughters of Missionaries, Sevenoaks, now in course of erection, the foundation-stone of which was laid by the Right Hon. W. E. Forster. . . . .

Day-Schools.—We now come to the general arrangement of middle day-schools. In considering these, it will be useful to observe the recent growth of elementary schools; for this purpose, I have exhibited drawings of Christ Church Schools, Battersea, which were erected by me many years ago for 600 children,—200 boys, 200 girls, and 200 infants; they were designed on the old system, then required by the Education Department, and consisted of one long room and one class-room to each division, the classes in the long room being divided by curtains drawn out at right angles from the walls. This school was erected at the then stipulated cost of 4*l.* per head, exclusive of the two teachers' houses.

On the establishment of the London School Board, many architects were engaged on the first schools projected, one of which fell to my share, viz., the Wapping School. The improvements very early made by the School Board are exhibited in this design for a school for girls and infants only, as shown in the more compact planning, the increase in class-room accommodation, the introduction of dual desks, &c. This tendency towards the increase of class-room accommodation is in accordance with German examples, and one of the most approved by Mr. Watson and Sir Charles Reed is Haverstock-hill School, designed by Mr. Robson. In this case there are four class-rooms to each large schoolroom, all of which are on the ground-floor, each of the large school-rooms giving space for as many desks as the four class-rooms belonging to it together contain; but with this striking peculiarity, that the central space, around which these school and class rooms are arranged, is covered, and forms a hall of assembly, wherein the whole school meets daily, and in which examinations can be held, and through which access is gained to all the classes, the glazed doors to each of which are commanded from the dais in the hall. This hall was originally designed as a girls' covered play-ground, and is so described in Mr. Robson's book, but experience has proved its great convenience in administration, and it is no longer used as a play-room, but contributes not a little to the educational success of the institution, at which my wife is a visitor. The "hall-passage system" had thus an accidental birth.

In Jonson-street School, Stepney, designed by Mr. T. Roger Smith, the large school-rooms were thrown aside altogether, and the one great hall alone retained, with separate class-rooms surrounding it on three sides, and all in direct communication with it. This school was professedly based on the Prussian system, but is a great improvement upon it, and is the best example of what Dr. Abbott has happily termed the "hall-passage system" adapted to schools of more than one story in height. I look upon this as the culminating point to which primary school buildings have grown, and I take this as the starting-point from which progress is to be made in the future development of secondary schools. That I am justified in this opinion the latest design for a secondary day-school by both these gentlemen is confirmatory. And, through their kindness, I am enabled to show you Mr. T. Roger Smith's design for the Grocers' School, and Mr. E. R. Robson's design for the Blackheath School of the Public Day-schools Company, both of whom have adopted the said "hall-passage system" in these middle-class schools, the one for boys and the other for girls.

Mr. Henry Clutton has also adopted the same principle in his design for St. Francis Xavier's College, at Liverpool, erected in 1875 as a middle-class day-school for 500 boys. The advantage of so planning a school building that the head master may, with the least loss of time and trouble, have the whole school under his supervision and control, must be manifest to every one who thinks of the difficulty of personally controlling a school of 500 or 1,000 pupils and their various masters. A hall, into which every class-room door shall open, where the pupils may congregate for prayers, for lectures, for examination, for separate instruction, in such groups as may be required by special circumstances, where they may meet and retire in an orderly manner to their several classes or to their homes, under the eye of the presiding genius of the school, is obviously an addition of no small importance to the welfare and discipline of the school. The moment that you introduce the corridor you destroy the possibility of exercising the same kind of influence; the hall, if you have one, becomes a costly appendage, of a stately character, but of no daily practical use, reserved only for special occasions. The teaching being done in the class-rooms, it has not the excuse for its existence which the old foundation schools had, for in them no class-rooms were provided. For these reasons I prefer Mr. Smith's design for the Grocers' School to that which has been chosen and erected, a plan of which shows that the hall is carefully cut off from the class-rooms by a corridor, which effectually isolates it, and gives to the head-master no personal control whatever of the movements of the school as a whole from such a vantage-ground, and thus the hall is rendered an expensive and comparatively useless luxury.

In designing the buildings required for the North London Collegiate School, at Sandall-road, Camden Town, and the Camden School for Girls, at Prince of Wales's-road, Kentish Town, I laboured under the disadvantage of having to incorporate therewith existing buildings in each case, and in the former to complete the new portion before I touched the old, so that the pupils might be transferred from the one to the other; but, feeling very strongly the representative character of these schools, I endeavoured to bring them into subjection to the latest, and, as I think, the best improvements in school planning. The task has been a difficult one, but success seems to be assured, even before the amended old part of the building has been entirely handed over for occupation, as in the case of the Sandall-road School.

Camden Schools.—The plans illustrate the general arrangements, concerning which, I may remark that the Camden School was first built and finished. The freehold of the Governesses' Institution, founded by Mr. Laing, was purchased for 5,500*l.*, and at a cost of some 7,500*l.* was adapted to the uses of the school. In this case, for economical reasons, no hall was desired, it being determined that the Clothworkers' Hall at the Collegiate School should be jointly used by the two schools on prize days, &c. The education given at this school is at a much lower rate than the former, and the classes number fifty pupils in each; on the ground and first floors there are nine such class-rooms, a gymnasium, a drawing-school, a lecture-room, library and committee-room, teachers' rooms, office, and caretaker's apartments; in the basement are the extensive cloak-rooms, drying-closets, dining-room, kitchen, and domestic offices. The girls enter by the basement steps on each side, proceed to the cloak-rooms, thence pass up to their several class-rooms, where each has a separate desk to herself; the use of the gymnasium, drawing-school, lecture-room, and playground being timed with great precision. Both hot water and open fire-stoves are used for heating and for drying clothes, and every class-room has arrangements for admitting fresh, and extracting foul air, independently of the windows. Owing to the administrative abilities of the head mistress, Miss Elford, no less than the completeness of the arrangements, this school goes like clock-work.

North London Collegiate Schools.—The old portion of the North London Collegiate School for Girls was originally an emporium, or general Store, and was adapted by me for school uses. It is now undergoing considerable alteration and addition, an extra floor and a new façade being constructed. The new buildings occupying the remaining portion of the site are finished, and were opened by the Prince and Princess of Wales last July. It will be seen by the plans [which we publish] that the accommodation comprises the following:—The great hall, presented by the Clothworkers' Company, and called by their name, 70 ft. by 39 ft., and 32 ft. high, with a wide gallery at the end, and a shallow one on the side at the level of the first floor, the raised dais and organ recess being at the opposite end on the ground-floor. The three stories of class-rooms are arranged on one side of the hall. The five class-rooms on the ground-floor, and those over them on the first floor, are in direct communication with the hall by the ground-floor of the hall and the side gallery. There are three class-rooms on the second-floor and a large drawing-school lighted in a similar manner to the Gloucester Art School. Under the hall is the dining-hall, and the kitchen, scullery, and housekeeper's room; under the class-rooms are the cloak-rooms and conveniences, the store-room, the teachers' room, the strong-room, the head-mistress's retiring-room, and the drying-room. The basement and staircase is heated with fresh warm air by hot-water pipes in channels to which fresh air is admitted in large quantities. The class-rooms have Boyd's School

Board ventilating grate and fresh-air admission shafts, and foul-air extraction shafts are everywhere; so that the necessity for opening windows is not felt, though cross ventilation by windows is easily attainable, not only by the fanlights over the doors to the hall, but by windows in the same intermediate wall. The triangular space over the boarded ceiling of the great hall forms a warm-air extraction shaft, hot-water pipes being placed at the foot of a vertical flue at one end. There are two staircases to this new building, one at each end of the corridor. This portion of the school has been in occupation some eight months, and the advantages of the system have been fully proved; otherwise, in spite of the known administrative ability of the head mistress, it would have been impossible to accommodate the whole school of upwards of 400 pupils without the use of the old part of the building. It is an interesting sight to see the pupils come in through the basement-entrance to the cloakrooms, where they enter at one door and retire at another, changing their shoes, as well as leaving their hats and cloaks, and passing up the staircases to the great hall, where they file in to their accustomed seats and await the organ peal, giving forth the morning hymn, followed by the prayers read by the head mistress, at whose command each teacher leads her class to its class-room, and the doors are shut, and work begins within and also without, in the great hall and gallery, which, at present, supplement the class-rooms in the old building not yet handed over, but about to be, next term.

The Old Building.—On either side of the main entrance to the old building are small triangular offices, at which inquiries may be made without further entering the building, at small windows provided; beyond these, on one side, is the head mistress's rooms, and on the other side, the general office and waiting-room, adjoining which is the board-room, which is also the library and museum. Over the board-room, on the first-floor, is the science lecture-room, with a chemical laboratory adjoining; the other two rooms are respectively a class-room and the teachers' retiring-room and library. The old staircase is retained to reach this floor, but the new staircase gives access to the second-floor, in which are two large and five smaller class-rooms, for music-lessons and practice. The caretaker's rooms are reached by a special staircase, and extend from the front under the turret to the back; a box-room is situated in the turret itself, and a lumber-room in the general roof. Behind the organ are passages on each floor, and a lift from the sub-basement and coal-cellar to the lift and cistern-room on the topmost floor. Two drinking-fountains are provided for each floor, supplied with filtered water, and lavatories and w.c.s, in addition to those entered from the cloak-room. The basement is occupied by a cloak-room, 30 ft. square, a cooking-school, kitchen and scullery, &c. It must be confessed that, upon this very awkward-shaped site, very little else could have been done had the buildings been rebuilt instead of only enlarged. The playground is much too small, and is partly occupied by the gymnasium, which is fitted with Stempel's apparatus. A fives-court is to be attached to the gable-end wall.

Such is a general description of these schools. I now come to consider one twice the size, which has recently been the subject of much discussion, viz., the City of London School. In my competition design for this building you will see a further development of the same principle of planning which I have been advocating, but which was as fatal to my success as to Mr. Smith's in the Grocers' School competition. The public has not yet been educated up to the "hall-passage system," and the selected plan in this competition repeats what I considered a defect in the former case,—the great hall is made a solitary apartment, carefully cut off from the uses of the school by the corridors surrounding it. In other respects the plan is suited to the site, but would be as complete without the hall as with it. . . . .

Mr. T. R. Smith's design for the Grocers' School is most compact. The class-rooms are arranged on three sides of the hall, with which they are in direct communication, similar to the admirable Board school erected by him at Stepney. . . . .

Mr. Robins then proceeded to consider the second division of his subject, namely, the planning of the parts, including an account of the fittings in the physical department of the Imperial College of Engineering at Yedo, Japan. We give illustrations of some of these fittings, and in our next will add others with the remainder of the paper.

ANNUAL HEALTH CONFERENCE:

SOCIETY OF ARTS.

It has been considered advisable to fix the date for the Society's Annual Conference somewhat later than was originally intended, or than has been the case in former years. It will, therefore, be held in the beginning of June.

As at the previous Conference, the Right Hon. James Stansfeld, M.P., will be in the chair.

It has been thought well that an attempt should be made to formulate and bring together the various resolutions which have been passed, and the various opinions which have been generally agreed to, in former years. With this view, a programme of subjects for discussion has been drawn up by the executive committee, and will be submitted to the Conference. The following are the subjects included in the programme:—

1. The development of Local Government administration, especially by the constitution of County Boards.
2. The extension of the powers of the local authorities of urban and rural sanitary districts. Amendments in the Public Health Act.
3. Sanitary inspection and classification of dwellings.
4. Amendments in the Rivers Pollution Prevention Act.
5. The advisability of strengthening the administrative organisation of the Local Government Board. Local Government Board Administration Areas.
6. Further suggestions by sanitary authorities.

ST. ENOCH STATION AND HOTEL, GLASGOW.

The accompanying plan and view show this new and spacious terminal station, offices, and hotel, belonging to the Glasgow and South-Western Railway Company. The station portion of the buildings is very extensive and complete. The platforms and side approaches are carried on brick piers and arches throughout, which form a splendid range of light, dry, stores for letting. The large roof over the platforms, constructed with arched iron girders or ribs, and purlins, &c., has a clear span of 200 ft.; the height is 85 ft., and the length at present about 550 ft. The principal ribs are 37 ft. apart from centre to centre. The station proper has been in use since the summer of 1878, but the hotel portion was opened to the public only some few months since. The main building has at present a frontage to St. Enoch-square of 260 ft., and it is hoped that the company, at no distant date, may be able to extend the building, as shown on plan, to Howard-street, when the frontage to the square will be 360 ft. in length. The north wing extends back from St. Enoch-square to Dunlop-street, a length of over 600 ft., and the height of the main building, from basement to bedrooms in roof, is 120 ft. The principal entrance to the hotel, from the approach to the station, is by a spacious groined open porch, having polished granite columns supporting the arches; while another entrance is provided from the station platform for visitors arriving by train.

The hall porter is conveniently placed to attend to both entrances, to receive letters and parcels, &c. In the inner hall, which is spacious and lofty, are an office for the bedroom clerk and the manager's private room. Here are also the lifts, one for luggage, the other furnished as an apartment for conveying visitors to the different floors. A broad, handsome Portland stone staircase leads up between the arcade to the first-floor of the hotel. Adjoining are a large dining-room and first-class refreshment room, with separate entrances from the station platform and hotel. The remainder of this floor is occupied by the company for station purposes, booking-hall, waiting-rooms, &c., and general offices.

All the kitchen arrangements are in the basement, and are on a very large scale; it is lofty and well ventilated. The principal kitchen is 85 ft. by 32 ft., and 20 ft. high, with arched ceiling of white glazed brick, the walls being lined to the height of 7 ft. with white glazed tiles. Every modern improvement has here been introduced. In the stack wall are placed the grills, hot closet for steaming potatoes and other vegetables, two steam-coppers for fish, puddings, &c., and a 7-ft. roasting range. In the centre is a large cooking-range, 20 ft. by 5 ft. which contains two gas-stoves, charcoal stove, &c., along with four close ranges. Within easy reach are the steam "dishing-table," 8 ft. by 3 ft., and separate compartments for heating plates and silver dishes. The pastry kitchen is fitted up with marble slabs, and there is an oven for the exclusive use of the pastrycooks. Close by is an extensive scullery fitted up with machinery for cleansing purposes, and the lift-rooms, fitted up with four self-acting hydraulic elevators. The larders extend about 60 ft. by 32 ft., and there are extensive wine, beer, and coal cellars. All the walls and ceilings of larders, dairy, and passages are lined with white glazed bricks. The floor above is given up to the working part of the hotel, and contains the servants' dining-hall, 50 ft. by 24 ft., and 20 ft. high, with kitchen and scullery; a suite of apartments for the hall matron, an extensive range of store-rooms for house materials, and a spacious laundry, fitted up with machinery and every modern appliance and convenience, and with hot closets in which clothes can be dried with great rapidity. The mezzanine floor, between street and platform levels, is entirely devoted to stores and working purposes.

On the ground or principal floor are,—the general coffee-room, 72 ft. by 33 ft. and 18 ft. high; music-room and drawing-room, *en suite*. There is also a grand suite of apartments along with the commercial dining-room and writing-room facing the square. On the opposite side of the corridor are dining and other rooms, and at the end of the corridor is a spacious billiard-room, 59 ft. by 35 ft., fitted up with three tables, with smoking-room adjoining and service-bar attached. There are also lavatories, service-rooms, and still-rooms, &c. The corridors are spacious and well lighted. The remainder of this floor is occupied by the general offices of the company. On the second floor are six private rooms and twenty-five bedrooms; on the third floor are half a dozen suites of private apartments and fifty bedrooms; and on the fourth floor are sixty-five bedrooms.

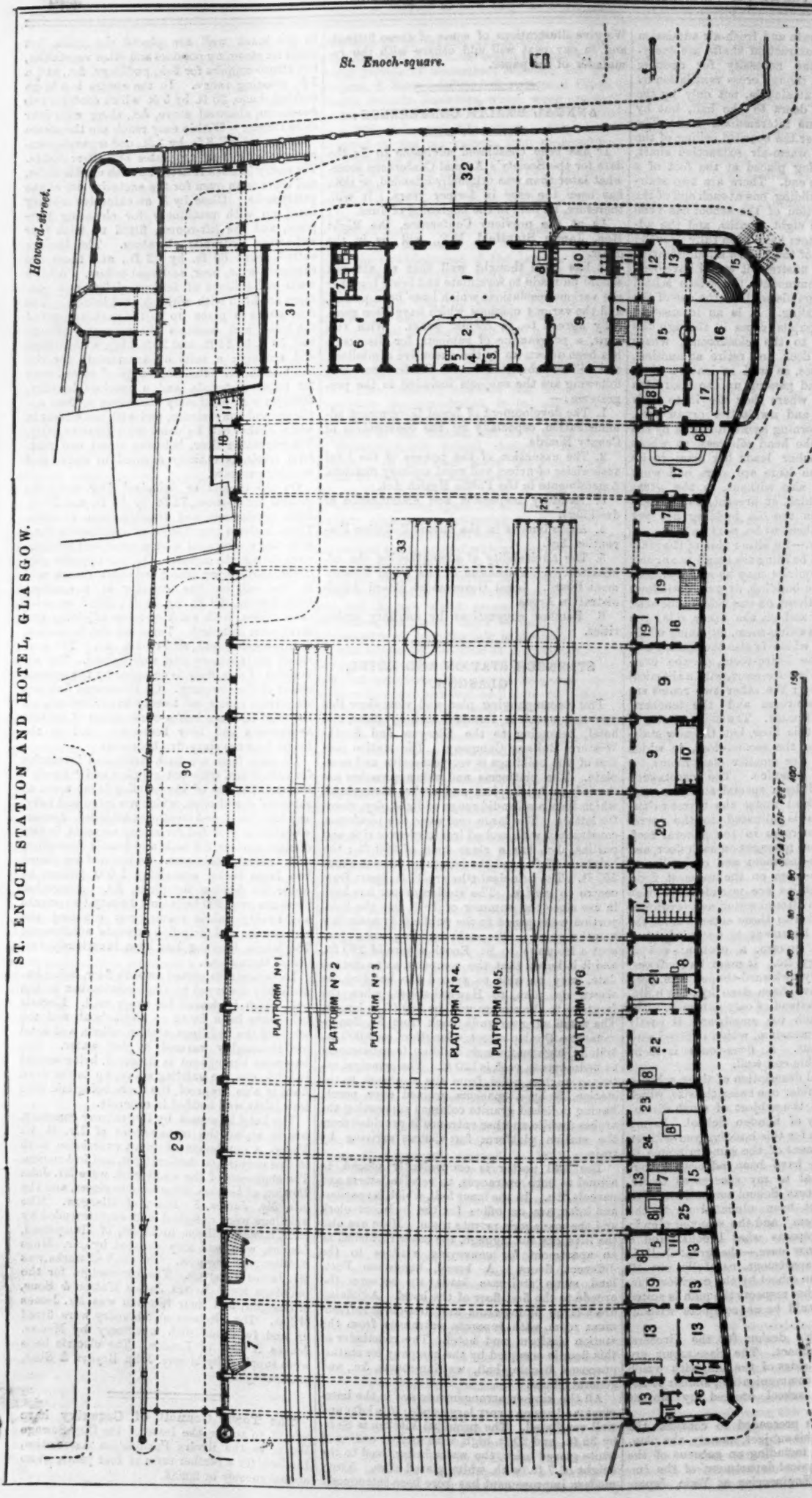
On each floor are bath-rooms and lavatories for both sexes, with hot supplies and "tip-up" basins. The top of the building is set apart as servants' dormitories, which are large and lofty, and have baths and lavatories attached. Accommodation is provided for eighty servants, in two distinct sections, for male and female domestics, with separate staircases. In the roof are placed two large tanks, containing 5,000 gallons of water for feeding fire-plugs, &c. Altogether there are over 200 bedrooms, twenty-two private and twenty public rooms, not counting the restaurants, and forty-five servants' apartments. The whole building has been luxuriously furnished throughout.

Letters can be posted on each floor, being immediately conveyed to the receiving-box in the hall, which is cleared for every mail. Electric bells have been fitted up throughout, and the whole of the buildings, station, offices, and hotel are thoroughly warmed by hot water. The basement throughout is fireproof, being arched in brick, and the building above, up to the third floor, is also fireproof, the floors being laid with iron joists well bedded in concrete.

The hotel is owned by the railway company, but is under the management of Mr. E. W. Theim, a gentleman of great experience, both in this country, on the Continent, and in America. The engineers of the whole work were Mr. John Dowler, of London, consulting engineer, and the late Mr. James F. Blair, of Glasgow. The buildings were designed and superintended by Mr. Thomas Willson, architect, of Hampstead, London, who was ably assisted by Mr. Miles S. Gibson, of Glasgow. The clerk of works was Mr. James Paterson. The contractors for the buildings were Messrs. James Watson & Sons, of Glasgow, and their foreman was Mr. James Millar. The kitchens and laundry were fitted up and furnished with machinery by Messrs. Jeakes & Co., of London. The electric bells were supplied by Messrs. John Bryden & Sons, of Birmingham.

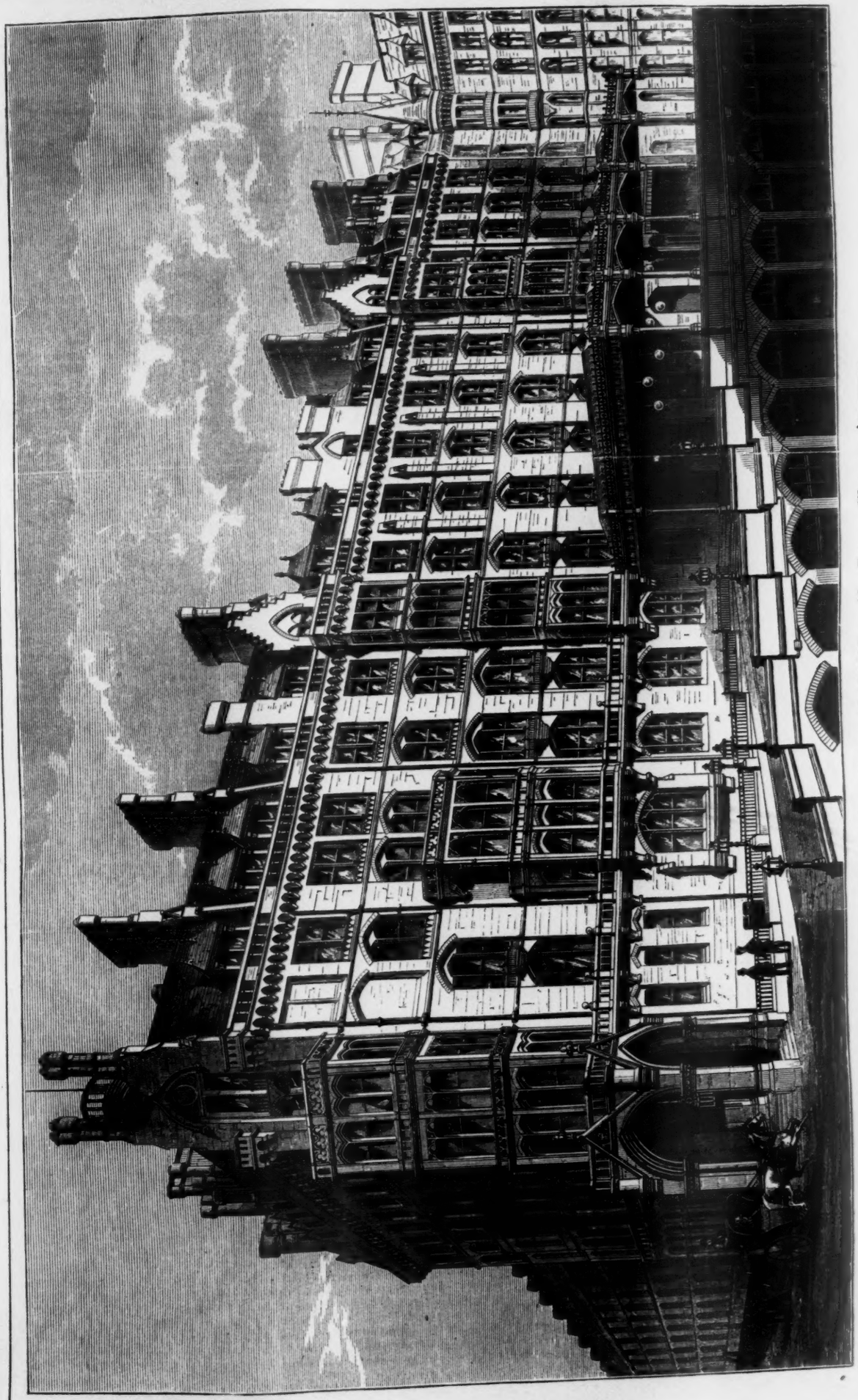
The Town Council of Coventry have agreed to renew the lease of the City Sewage Works to the Rivers Purification Association, Limited, for a further term of four years, at an annual subsidy of 2,200*l*.

ST. ENOCH STATION AND HOTEL, GLASGOW.



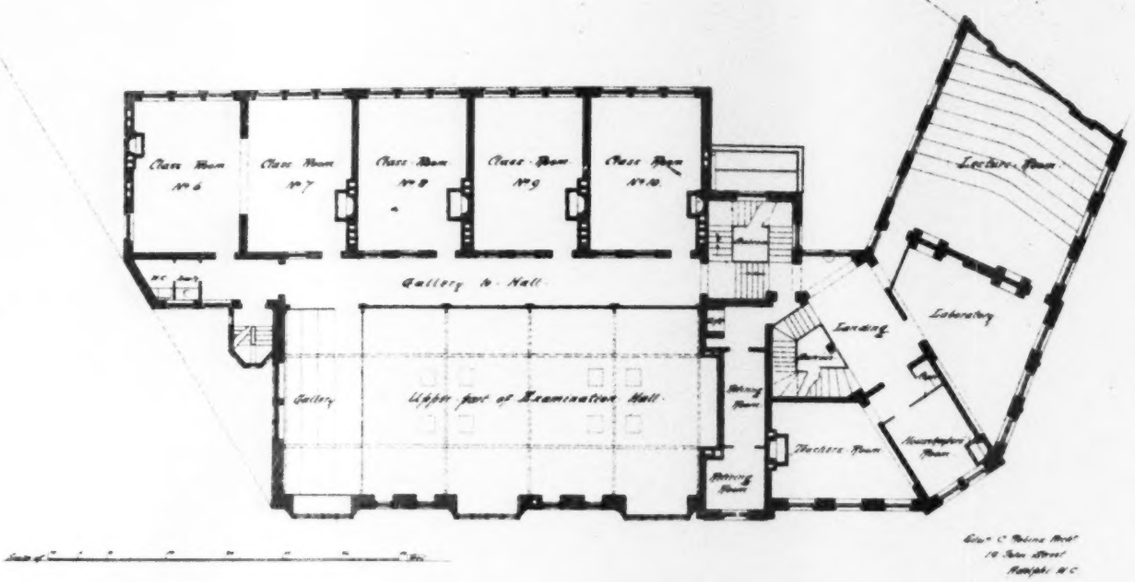
Plan of Platform Floor.

1. Booking-hall.
2. Booking Clerks.
3. Station-master.
4. Clerks.
5. Telegraph.
6. Left Luggage.
7. Staircases.
8. Lifts.
9. Waiting-rooms.
10. Retiring-rooms.
11. Lavatories.
12. Manager.
13. Offices.
14. Entrance-hall.
15. Halls.
16. Dining-room.
17. Refreshment-rooms.
18. Stores.
19. Inspectors.
20. Lost Luggage.
21. Public Stationery.
22. Parcels Office.
23. Hot Water.
24. Lamps.
25. Guards and Porters.
26. Mr. Mathieson.
27. Book-stall.
28. North Approach.
29. South Approach.
30. C. C. Stand.
31. Carriage-way.
32. C. C. Way.
33. Carriage Incline.



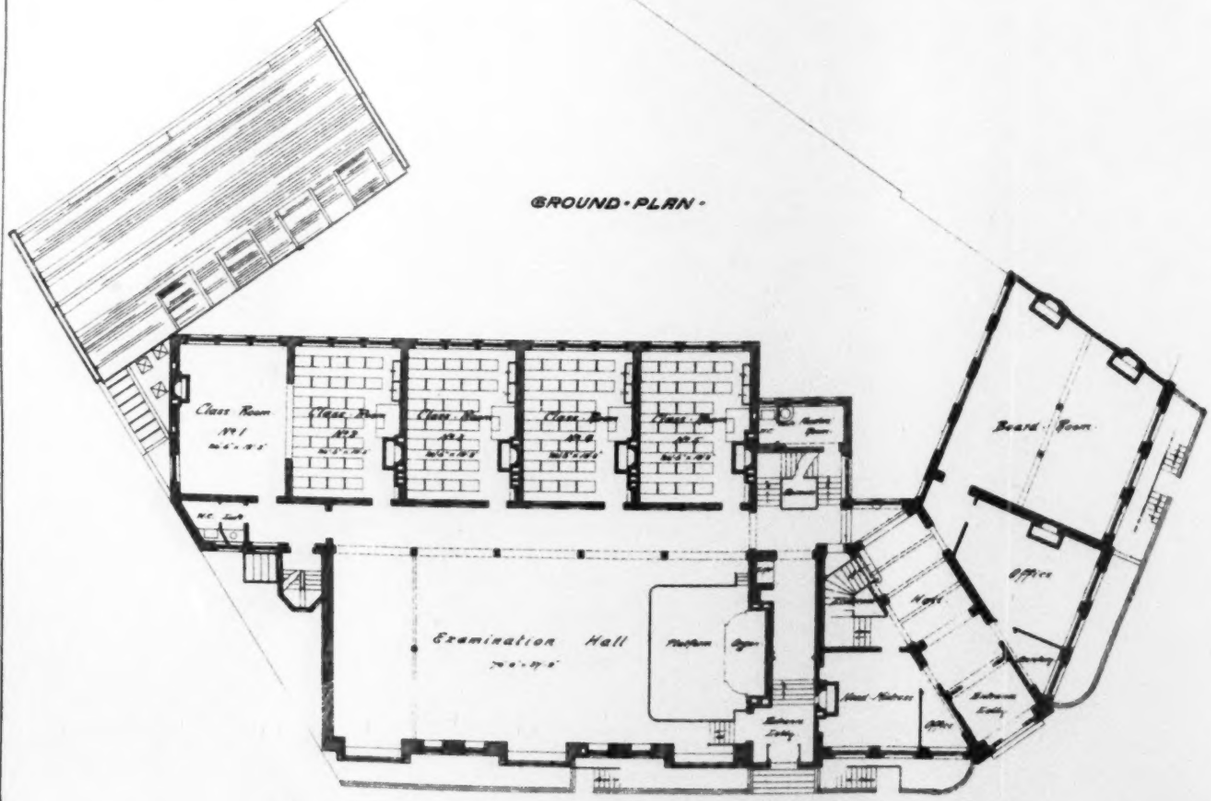
ST. ENOCH STATION AND HOTEL, GLASGOW.—Mr. Thomas Willson, Architect.

FIRST · FLOOR · PLAN ·



THE · NORTH · LONDON · COLLEGIATE · SCHOOL · FOR · GIRLS ·

GROUND · PLAN ·



THE · NORTH · LONDON · COLLEGIATE · SCHOOL · FOR · GIRLS

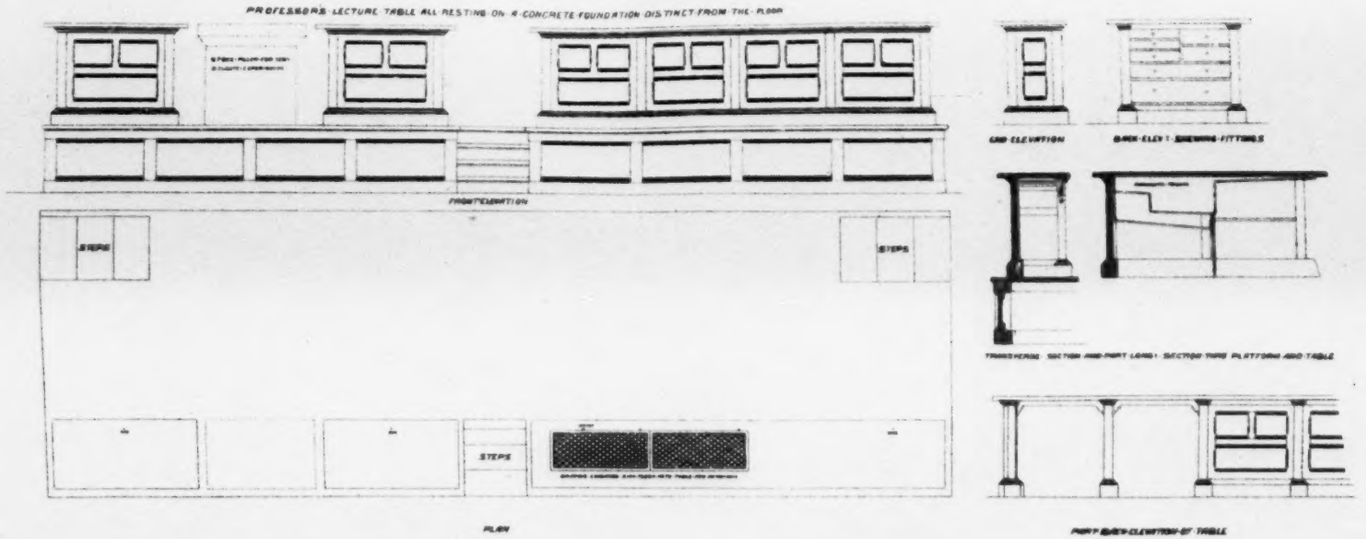
Edward C. Robins, Architect, F.S.A.

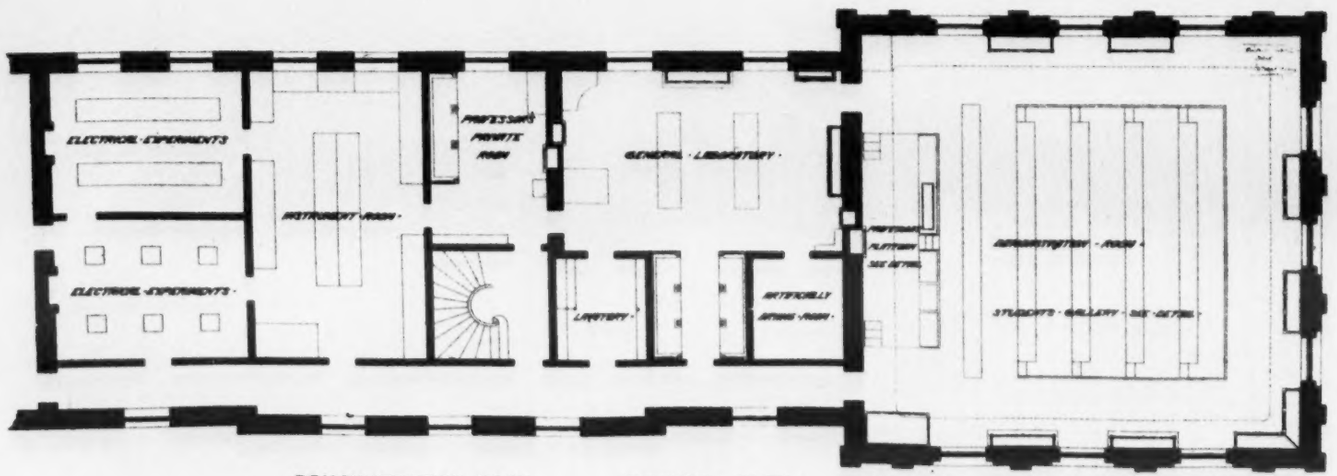
The Clothworkers' Hall

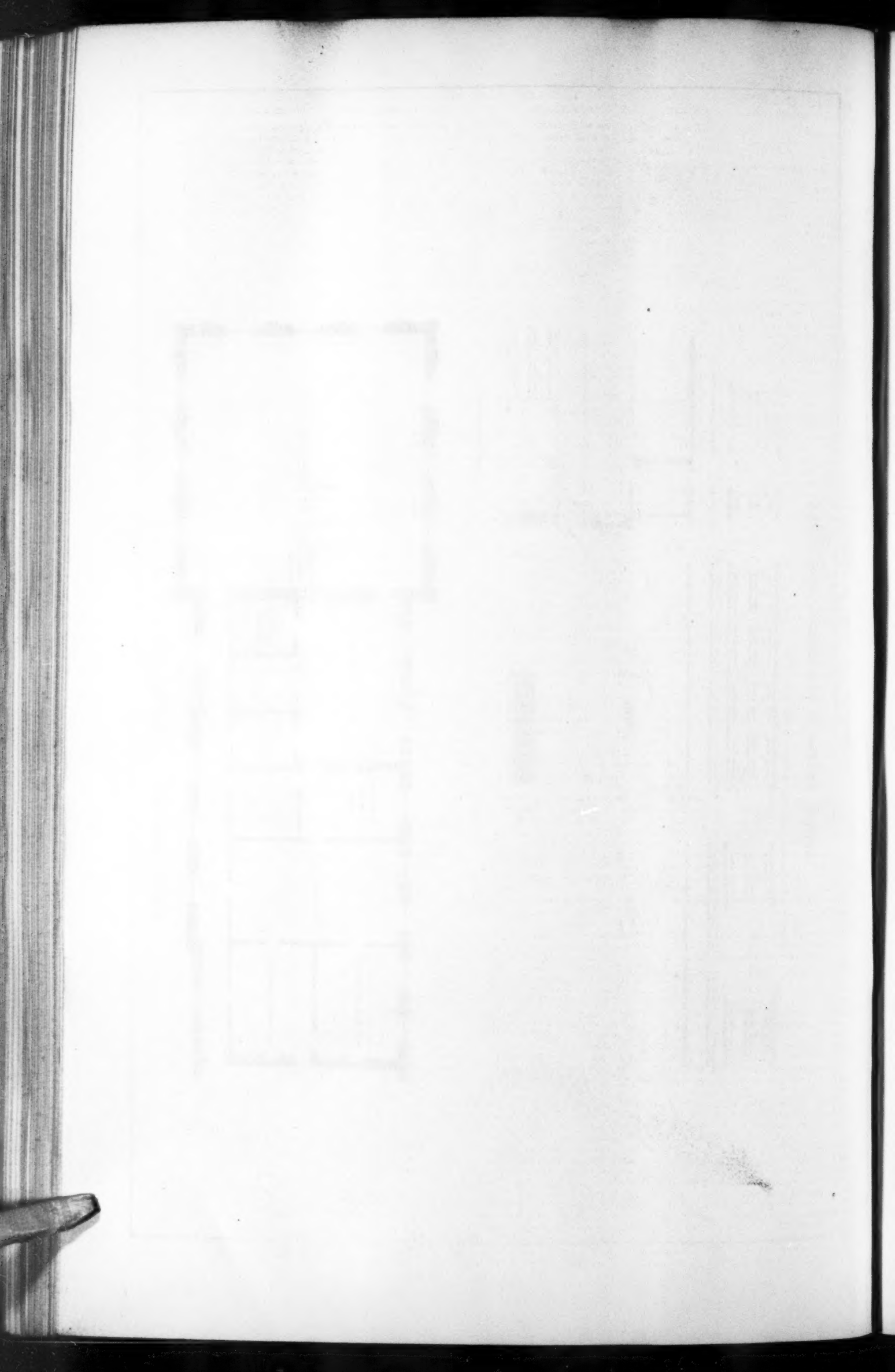
THE NORTH LONDON COLLEGIATE SCHOOL FOR GIRLS
Sandall Road School

Interior View of Proposed Examination Hall. E.C. ROBINS, ARCH.T. 1 JOHN STREET W.C.

IMPERIAL COLLEGE OF ENGINEERING, YEDO, JAPAN.







AN INTRODUCTION TO THE STUDY OF THE FINE ARTS.*

We have ventured, perhaps, into too long a digression from our thesis, that art commences where man commences to adapt means to an end, to his own purposes, and that it is only a difference in the kind of purpose to which he adapts his means that constitutes the difference between mechanical and fine art,—between the flint implement and the finest statue. The principle of adaptation to purpose may be less evident in works of fine art than in works of mechanical utility, but it is nevertheless the underlying principle of excellence. The perfect fulfilment of purpose in a work of fine art, whatever that for the nonce may be, requires to be considered from so many points of view, that we cannot feel surprised if this principle is not so obvious in fine art as in other kinds of work, that success in the higher walks of art is so rare, nor that many art productions look as if nature's journeymen had made them. We should never forget that man, when he is successful, works as nature's self when she is successful, and that adaptation to purpose is nature's own great aim. The very art which we say adds to nature is, as Shakspeare puts it, itself an art that nature makes.

It is often said that the object of art is to please: that is equally the object of every trader; but in art, as in trade, the pleasing is not always effected by legitimate means. The world is ever deceived by ornament, by various kinds of legerdemain, and meretricious seeming. But who are they who are "taken in"?—who are they who are deceived so readily? Are they not the impulsive ignorant, and not the men of culture and calm judgment? The aim of the artist, then, should certainly not be to please the former, but the latter,—the men of wisdom, the keenly and justly critical, that in carrying out his work he may receive suggestions, and in its completion, confirmation, that he has been observant on all sides,—has neglected nothing, no consideration whatever, which would have left it less perfectly adapted to its purpose. The artist who inclines to trifling in art is apt to assert that the object of art is to please, and pleases those on the same mental level as himself, regarding with aversion and with contempt efforts of a more elevated kind designed to satisfy a higher intelligence.

If we reflect for a moment we shall find that the fine arts admit of the designer, be he poet, painter, or sculptor, dealing with elements which are, in themselves, by no means pleasing, with villainy of all kinds, with treachery, with murder, with misfortune, tempest, and wreck, with ugliness and deformity,—with the grand and the terrible. How, then, do such presentments satisfy the mind in art,—though as elements they are unpleasing,—unless it be by the fitting way in which the artist has used them to effect a desired end? The mastery of art is to him who can select and devise means to ends; and we derive satisfaction not from the disagreeable elements made use of, but by the recognition of that mastery which has wielded them for the perfect fulfilment of a purpose. Men are too apt to muddle up together the various phases of art. The purposes of art are manifold, they are nearly as various as the purposes of nature's self, and they have to be discriminated to be perfectly grasped and understood. The presentment of the beautiful is not its only object, as many seem to think,—it sometimes aims at the grand and the terrible,—it deals with comedy as well as tragedy, with the real as well as the ideal, with the disagreeable as well as the pleasing,—but when it deals with the worse elements, with the night side of nature, it must not be to exalt, but to use them as a foil in some great concept, which has for its purpose the exaltation of the beautiful, the noble, and the right.

There is in the young artist, always impulsive, a ready disposition to revolt from so common-sense a view of art as that which reduces its great principle to that of adaptation to purpose. He is too apt to consider common-sense to be a very common thing, and not, as it is, the most difficult sense to attain to, the very highest sense, the sense, in fact, which stands to flighty eccentric and individual opinion in much the same relation as the statue of the Apollo Belvedere does to the forms of individual men. Common-sense is the ideal sense, the mean of all the possible errors of opinion on any subject, and therefore that sense to which art, to be excellent, must be conformed; nay, I will venture to assert that when your genius snatches, as it has been described, a grace beyond the reach of art, he does so by possessing a greater range of common-sense than even those who pass for wise,—he only snatches a grace of common-sense beyond their reach, not his. Just consider for a moment the gross inconsistency with which those enthusiasts are possessed who, whilst insisting that such snatches of genius are divine, maintain that they are so in virtue of their being achieved, if not without rhyme, at least without reason.

The principle of adaptation to purpose is so important a one in the economy of nature that all treatises on natural history are but commentaries upon it. Let us probe as deep as we may, from the skin to the muscular system, from the muscles to the nerves and arteries, and from the arterial system to the skeleton, or passing from the construction of the human fabric to the soundings of the solar system and to the universe at large, and what do we find but everywhere adaptation to purpose? And the artist, when rightly schooled, does in all that he designs but follow, in his narrower sphere, the example of the universal and dominant activity.

This principle is so dominant in the economy of nature, that it has led some persons to erroneously imagine that whatever is adapted to its purpose must necessarily be beautiful, although the number of illustrations which might be readily cited to prove that this is not the case ought to prevent its constant reiteration. The great creating nature did not constitute everything, and every creature, in such proportions as would be beautiful to man. There are many creatures which, though perfectly adapted to their purposes, are ugly and repulsive to us. The very circumstance of the existence of ugliness shows that it is an element in the constitution of things. The beautiful is but a certain conformity to human taste. The beautiful, besides being adapted to our taste, may be adapted to some other purpose; but the converse of this, or that everything that is adapted to a purpose, is beautiful, by no means holds good. This important distinction should never be lost sight of if we desire to avoid the risk of being betrayed into taking part in some Quixotic propaganda, insisting that everything should be made beautiful in this world. If this were possible, we should at least bear in mind its consequences, or that the vocation of the artist, that of discriminating and portraying the beautiful for our delectation, would be gone. But that some nature,—the human form, for instance,—is capable of being progressively developed to perfection and beauty there can be no manner of doubt. They who argue that the useful must also be beautiful, do so, I am inclined to believe, under the erroneous supposition that nature is under all conditions beautiful. The Creator, as Sir John Herschel once wrote to me, had other purposes in view in the constitution of the universe than that of beauty. Neither in Nature's empire, nor in the vice-regal kingdom of art, is everything to be beautiful; the pretty, the ugly, the grand, and the terrible must have their presentments, and the artist shows mastery and command over means when he successfully adapts these to produce the impression desired, to the purpose in hand. But even when the artist's purpose is other than the presentment of the beautiful, he must, as Shakspeare commands, beget a temperance, when he ventures, as he sometimes must, in order to perfectly fulfil the purpose which he has in view, to deal with extremes, with the ridiculous, the villainous, the tragic, the grand, and the terrible.

It is true that we must be cautious in affirming any principle to be absolutely inviolable. When, therefore, we put that of adaptation to purpose forward as Nature's leading principle,—creative principle,—we do so rather as leaping to the perception of her purpose in the aggregate than as asserting that all that she does is unmistakably stamped with utility. Dr. Darwin, in touching upon this matter, refers to several instances of inutility in the organisation of animate being,—to birds, for instance, with webbed feet, which never enter the water. Nothing can be plainer, he says, than that wings are formed for flight, yet in how many insects do we see wings so reduced in size as to be utterly incapable of flight, and not rarely lying under wing cases firmly soldered together? Yet even here, the aborted wings may be a necessary gradation towards some wider purpose than that which is fulfilled in the mere life and purpose of the insect itself.

But in discussing this great principle of adaptation to purpose we have to take note that the whole tendency of modern inquiry is to confirm the important generalisation that the form of experience, of phenomena, of our knowledge, is quantitative; the principle of adaptation to purpose resolves itself, therefore, into that of adaptation of proportion to purpose; art is essentially the proportioning of means to ends. The science of art is a science of proportion, and this science I have endeavoured to work out.

It is a curious circumstance that you will find many art enthusiasts of the present day speaking of art as if it existed apart and independently of human agency. They exhort you to study art, as they would exhort you to study either mechanics or chemistry. But what are we to study? The theory of the fine arts has had, as yet, no masterly exposition; we have romancing essays by the score, and some few sensible fragments, but there is no compendium of their principles. All, therefore, that the student can do in response to the exhortation to "study art" is to copy the remains of ancient art; and this really seems to be the sum and substance of what is generally meant by those who exhort you to "study art"! But this advice has been followed in this sense, time out of mind, without producing any very decided or wholly satisfactory results, certainly not as satisfactory as the public were led to expect. Those who are continually advocating this kind of study do so under the erroneous supposition that this is the one only way of studying art; and they cannot perceive wherein it is inadequate to effect the end proposed. They cannot understand the full significance of the fact that a work of art is, in itself, dumb to all interrogatories. Works, though by Phidias or by Raffaelle, cannot give the student the reasons why they are thus and thus, and it is this knowledge alone which would make the study of such examples profitable. As, therefore, we cannot learn from the study of ancient example alone why the artist treated his subject in such and such a way, the student of the present day must study nature for himself; and when we say that he must study nature,—we mean, in using the word "study," to imply more than the mere copying of external forms and appearances,—we mean that he must study the internal nature, the constitution of the senses, and the intellect to which all fine art is addressed, and which to rightly address is fine art's true purpose. We may thus, after a time, in precisely the same way as they did of old, obtain principles to guide our practice. It is only upon principles thus derived,—upon such contemplative study,—that sound and enduring art can be built.

As we have referred with some degree of emphasis, to the importance of studying the human nature, we will enter upon a brief consideration of this department of study,—for it is the adaptation of art to the sensuous and intellectual nature of man, as we have already stated, which constitutes its highest purposes. It is, in truth, a successful adaptation of art to the cultivated human nature which entitles such work to rank as fine art, and as high art. It is not alone sufficient that a work of painting, or of sculpture, be a mere faithful transcript, a mere photograph, or cast, as it were, from external nature, unless, as in rare instances, the nature copied be so perfect as to recommend it to the cultivated taste,—to the true critical faculty. Those who insist on the literal copying of nature, do so under the erroneous conviction that nature must always be right, whereas in some instances her works are disproportioned, distorted. It is true that a mere imitation or transcript of external nature may have a certain degree of merit and value of its own, but its purpose is of a very narrow, a very limited kind, of a kind which can never claim equal rank with that finer or that higher art which is conformed to the cultured understanding. Just as our human nature demands that the higher or poetic diction should have a certain measure or rhythm, so it also demands that the higher kinds of painting and sculpture should exhibit a certain balanced and proportioned harmony, a symmetry in conformity with a cultivated and balanced intelligence. And it may be noticed that the human intellect, as it more and more nearly approaches this proportioned and balanced excellence in the progress

* See p. 407, *ante*.

of civilisation, gradually compels the arts of painting, sculpture, and architecture to manifest themselves in those more balanced, symmetrical, or ideal forms which have always characterised the culmination of the great art epochs, the works of the greatest artists. Progress, indeed, in all things consists in moving towards this moderation, this more symmetrical condition: hence that marvellous summing up of the experience, of the wisdom of ages, in those remarkable words,—"He that striveth for the mastery is temperate in all things."

As we are touching upon the important principle of moderation, or temperance, in art, it is, perhaps, the proper moment to animadvert on that besetting tendency of artists, and more especially of art-students, to take up with some extreme or other: it may be of execution, it may be of style; if of style, they will either insist on an extreme definition of outline, or on a hazy boundary; either on a literal, over-minute rendering, or on a dashing, sketchy licence. One will look solely to form; another to nothing but colour and effect. One shall aim at producing vivid daylight; the other the profoundest depths of tone. This one shall paint entirely in opaque colour, and thickly as with mortar; that other in transparent colour, in thin glazings; and so on through all the contrarieties or extremes with which it is possible for an artist to deal, and each oblivious to any other aspect of his art than that upon which he has determined to rivet his gaze. Herein they betray their forgetfulness of the constitution of the higher human nature, which steers, as it were, a mid, or mean, course between opposite extremes, any one of which has its special danger; that course which commends itself to a correct judgment, to a cultivated taste,—"*In medio tutissimus ibis*,"—holds as good in taste as in conduct. This Golden Way is as safe for the artist as the man. The principle of Moderation is the very principle of beauty itself, and thus the *beau ideal* is a correlate of the moral ideal, it is the *moral* form. The principle of moderation is the principle of stability in nature, and all art that is to endure must be conformed to it.

Testimony to the truth, and to the importance of the doctrine of the *mean*, will be found in all kinds of criticism. The critic will be found to be continually objecting to the artist having erred either on the side of the too little or the too much; either in defect, or in excess of what he ought to have done, of that mean in which rectitude inheres. Although unconscious of the nature of the principle which determines his judgments, the critic, in the very expressions which he uses testifies to the mathematical or quantitative *form* of his experience. Testimony to the truth of the *mean* being the mathematical expression of rectitude comes down to us from a remote antiquity. Its truth has authoritative and logical confirmation as strong as these are possible to be. And Addison may have been dwelling on this testimony when he wrote,—"There is a *mean*, and a certain measure, wherein the Good and the Beautiful consist, and out of which they never can depart."

The principles of the fine arts are not to be arrived at by inflated rhodomontade. They require as close, if not a closer and more rigorous, investigation than those of the other sciences. There has, of late, been no greater barrier against our obtaining a strong grip of art-questions than the shifting signification of the word *nature;* which sometimes only denotes what is right; at others, all that was, is, or is possible,—nature in its totality. These two significations get transposed and confounded in the course of argument, and hence the limited signification is transferred to the whole, and the misconception that whatever occurs in nature must be right. Under this misconception painters will insist on an exact rendering of whatever nature presents to them. They forget that nature, in the wider signification, does both right and wrong. Nature produces a fine horse, and also one with two heads, or some other greater or less malformation, and so on throughout animate being. We must hold fast the notion that nothing can happen but what is within the compass and power of nature; that not everything that is is right; and that the indiscriminate imitation of nature will inevitably lead us into error.

To me it would appear almost like uttering a truism to say that nature is not always either right or beautiful. Yet there are critics and painters who maintain the contrary. If they were correct, there would, of course, be neither wrong nor ugliness. The selfsame critics and painters, however, as stoutly maintain that all who hold a contrary opinion are hopelessly wrong. It may be true that nature always averages right, but from this mean her individual instances are more or less erratic. The artist has not only to select from what happens, but also from what is possible, that best adapted to the purpose he has in hand.

Let us now briefly review the ground traversed. We have shown that the successful prosecution of the study of the fine arts depends on certain favourable social and political conditions. That in the great art epochs the system of art education and of art encouragement was always the same, and quite different from our own. That art is the index of a nation's culture, the outcome and not the cause of civilisation. That every stage in the progress of the intellectual development of a nation impresses its characteristics upon the art of the period. That the finest, the highest kind of art, is the flower of the highest intellectual culture, and, therefore, only found at the culmination of a civilisation. We then went on to show that the motive of great creating nature, in her works, is that of adaptation to purpose, and that the artist, as the imitator of nature, as creative in a lower sphere, is most successful when actuated by the same motive,—that the fine arts are adaptations to man's sensuous and intellectual natures. We also pointed out the fallacy of the notion that any production of nature must necessarily be beautiful because perfectly adapted to its purpose; that such a production being beautiful depends upon whether it be also in conformity with human taste, with man's sensuous nature. We then drew attention to the fact that the whole cycle of scientific investigation tends to prove that the form of our knowledge is quantitative, and capable of mathematical expression,—that the mean is the stable pole, about which every species of phenomenon fluctuates, is the mathematical expression for rectitude in nature, for the "good" in morals, and for the beautiful in nature and in art. That if the form of our knowledge be quantitative, all our knowledge is fundamentally that of proportional relation, and the doctrine of adaptation to purpose resolves itself into that of adaptation of proportion to purpose. That all art is intrinsically proportioned adjustment, not only in respect to form, but to colour, &c., and that its principles are, therefore, capable of being mathematically formulated.

There is, perhaps, no kind of work which requires such various and extensive knowledge as the pursuit of the fine arts. The artist must not only be able to take a comprehensive view of nature and of the philosophy of art, but he must also possess a vast amount of information of anatomy, of the theory of colour, &c., before he can proceed in his profession with any confidence and certainty. Moreover, there is a vast amount of technical education which has to be acquired in reference to pigments, vehicles, &c. One of the most unfortunate tendencies of the English art-student is that to hurry and dash. He will not give himself time to acquire accurate knowledge; he is, as a rule, in too great a hurry, in too hot haste to take thought about technical procedure. If a work can be knocked off by some sleight of hand, well and good; but for a well-considered purpose, deliberately and patiently carried through, he has no inclination. This tendency to slap-dash afflicts the English student from the very outset of his career. With him there must be no painstaking, no stippling, no dwelling carefully and inquiringly on the nature before him. He must, above all things, be bold, and so he plashes either charcoal or colour into pronounced incorrectness. He has yet to learn that to be either in excess of or to fall short of the truth, is equally an error. Let him, before all other considerations, strive to be correct. Let him observe how carefully the great masters proceeded; with what painstaking they made the studies for their great works. The young artist has yet to learn that the grandeur of the greatest works is more due to the intellectual conception than any surcharge of line, any excess of colours, or plastering of pigments. There is the boldness of impudence as well as the trepidation of timidity, and neither is to be commended,—is the thing to be admired and encouraged. Seeing, then, how much the artist has to learn in theory and in practice, and how many things he has to consider and to weigh, we may safely affirm that to none of the labourers in life does the declaration,—"How poor are they who have not patience," more aptly apply than to the student of the Fine Arts.

W. CAVE THOMAS.

ROYAL INSTITUTE OF BRITISH ARCHITECTS.

AT the seventh ordinary meeting of the session, held on Monday evening last, Mr. John Whichcord, president, in the chair, several donations to the library were announced, including the presentation, by Mr. Hall, of the whole of the drawings and account-books relating to Worsley Hall, one of the most notable of the late Mr. Edward Blore's works. In reference to this gift, Mr. Hansard said he considered Worsley Hall one of the most valuable of Mr. Blore's works. The mode in which Mr. Blore carried out his works was somewhat peculiar, inasmuch as he made a complete portfolio of drawings of each building which he erected, and kept all the accounts of the cost of every detail and description of work carried out under him. The drawings and accounts now presented to the Institute were, he hoped, only a sample of what the Institute might hope to see in its library in the way of complete sets of drawings and other particulars of works carried out by architects of celebrity. The drawings and accounts of Worsley Hall and Church were a complete series, and dated back to the years 1826, and would be supplemented, he hoped, by other series, given by architects during life, or bequeathed by will. Such particulars and details were most valuable, as showing the methods of work in vogue, the cost of materials, and the rate of wages. Mr. Blore's works were carried out under a very different system to that which now prevailed,—indeed, he was really contractor as well as architect for the buildings he carried out, and was remunerated by a percentage on the whole of the work.

A vote of thanks was unanimously accorded to the various donors, the President observing, with reference to Mr. Hall's gift of Mr. Blore's drawings, &c., that he could only emphasise what Mr. Hansard had said as to the great value and interest of such particulars, and he thought that the Institute collection would be very much enriched by the presentation of drawings and details explaining not only the methods of executing works, but the modes of conducting architects' offices and practices at different periods. No doubt, if similar presentations became numerous, some amount of labour would be involved hereafter in annotating and indexing such documents in order to make them generally useful, but that labour would be gladly undertaken.

The Secretary (Mr. William H. White) called attention to the fact that the drawings executed in Italy by the Soane Medallist for 1877 (Mr. William Scott) were exhibited; and he intimated that Mr. Joseph Clarke, treasurer, and Mr. C. F. Hayward, secretary, of the Barry Portrait Fund, were still awaiting subscriptions to the fund.

Mr. J. P. Seddon then read a paper on "Decoration," the first portion of which we print on another page.

The President, in inviting discussion, said he thought the members of the Institute had rarely had a paper read to them which had challenged or suggested discussion more than Mr. Seddon's paper.

Mr. F. C. Penrose said he had heard Mr. Seddon's paper with the greatest pleasure. The author had dealt with the question of colour decoration in an admirable manner, and had taken reasonable views of the subject. In some minor points he (Mr. Penrose) might differ from him, but, on the whole, their views were in accord. Early in his paper Mr. Seddon had referred to the question of employing architects instead of tradesmen or amateur decorators in decorating the most important portions of our buildings, whether public or private. Of course, in private buildings there were many small and unimportant parts the decoration of which the architect could hardly always be expected to consider, but all features of importance, such as the larger halls, rooms, corridors, and staircases, were eminently worthy of decoration under the direction of the architect. In public buildings, whether civil or ecclesiastical, no one but an architect could rightly determine what ought to be done. But even in public buildings there was still room for the painter and decorator to work with the architect, but not in such a way as to mar or

obscure any of the architectural lines or features of the building, as was sometimes the result when decorators were employed. With regard to what was proposed to be done at St. Paul's, he (Mr. Penrose) hardly felt at liberty to speak upon the subject; but he hoped the time would soon come when the whole matter could be brought before the Institute. With regard to Cinque-Cento artists, he thought they were on the right road, and that many of them executed the very best works of decoration that had ever been done, leaving out of account perhaps, the few remains of Classical decoration.

Mr. Tylor said that Mr. Seddon was kind enough to attend a lecture which he lately gave before the Anthropological Society on the ornamentation of animals, in which he enumerated the general laws which he found to prevail in the ornamentation of the external coverings of animals. He found that, as should be the case in all good architecture, the decoration of the coverings of animals generally emphasised "function." This was notably the case in the tiger, the leopard, the zebra, and particularly so in many of the venomous snakes of India. It had been said, he believed by Mr. Ruskin, that there was no law of colour in nature, but he thought the examples he had quoted, besides innumerable others which he might quote, proved the contrary. In birds, too, marked emphasis of colour was invariably given to the pinions and other functional parts.

Mr. Edwin Nash spoke of the difference between what might be called the painter's method of painting glass and the architectonic method. The first method was well illustrated in the Munich windows, which, excellent as they were in themselves, where wholly wanting in the architectonic effect of Mediæval glass, which was infinitely superior for filling windows to the admittedly beautiful pictures on glass which came from Munich.

Mr. J. D. Crace said he could not quite agree with all the arguments that Mr. Seddon had used; but he should be glad to be allowed to offer his testimony to the beautiful effect of the mosaic pavements executed in the crypt of St. Paul's from Mr. Penrose's designs.

The President, in closing the discussion, expressed the indebtedness of the members of the Institute to Mr. Seddon for his paper and for the numerous coloured drawings with which it was accompanied, and to Mr. Penrose, Professor Hayter Lewis, and Mr. Tyler, for the many beautiful drawings which supplemented those exhibited by Mr. Seddon.

ROMAN CANTERBURY.

MR. C. ROACH SMITH steadily and persistently continues the publication of his valuable repertory, the "Collectanea Antiqua." Part iii. of the seventh volume will be issued in a few days. In the course of it, the author, after speaking of the second edition of Mr. Brent's "Canterbury in the Olden Time," makes some observations on the Roman walls of Canterbury and other towns, which may be usefully reprinted. We shall be glad in doing so if it should lead to the ventilation of the subject in our pages. Mr. Roach Smith says:—"Mr. Brent's chapter on Roman Canterbury suggests a few remarks which I hope may tend to encourage him, in spite of obstacles, to prosecute his researches with an especial view of determining the question whether the walls of the city as they now stand are based upon the foundation, and enclose the core of Roman walls. I never doubted their being upon the line of the Roman circumvallation; and I submit that the objections raised do not at all decide to the contrary. It would be an inexplicable novelty, for a city of such importance as the capital of the Cantii must have been, to have wanted walls. All the towns, both in Britain and in Gaul, which were the capitals of tribes or peoples, were substantially walled; and this, I believe in every instance, can be proved by remains more or less visible at the present day. These cities in Gaul have mostly retained their names as capitals of the peoples, while the superimposed Roman name has been lost. Thus Paris is so-called from its having been the *Civitas Parisiorum*, while the Roman name *Lutetiæ* is lost; Evreux, the capital of the Eburovices, is so called from the people,—the Roman name *Mediolanum* did not survive; and so in numerous cases; but in England, Canterbury is the only capital city which derives its name in like manner. The Roman *Durovernum* is absorbed in the influence of the *Cantii*, of whom it was the *civitas* or *bury*. Different from Gaul, the other British capitals have retained the names given by the Romans, and they were all walled.

Canterbury had pre-eminence also from its situation at the junction of three roads leading from three ports, each of which at Canterbury would be a day's march or journey. A resting-place for soldiers or travellers, it must have been well provided with barracks and inns. That it was never a permanent military station must be conceded from the entire absence of all those evidences which are inseparable from such towns. The early and entire pacification of Cantium rendered such posts needless; those on the Saxon shore being garrisoned at a late period of the Roman rule.

It was not at all necessary that a town to be walled should be a fixed military station. Colchester, London, Chichester, Winchester, and others were not permanently occupied by legions or auxiliaries; yet they were fortified as strongly as Caerleon, Chester, and York, which were the quarters of the three legions assigned to Britain during the Roman domination. It is doubtful, it may almost be said impossible, that the walls of any of these towns are utterly destroyed; even above ground they cannot well be eradicated. But, occasionally, it may be difficult to point even to a fragment of what may be Roman masonry; and this is now the case at Canterbury. Stukeley has given drawings of what, I think, could have been nothing but Roman work; but what he saw and sketched has fallen before municipal wants for the present and apathy for the past. Municipal authority, when not controlled by patriotic wisdom, is a mighty lever for the overturning of Roman walls. The magnificent and perfect remains at Dax, preserved by imperial despotism, have been razed by republican liberty for the miserable object of making votes for the Town Council. Napoleon saved; Thiers destroyed.

Chichester may be selected for comparison with Canterbury. It was the capital of the Regni, and must have been about equal in extent to Canterbury, and, like it, enclosed large open spaces never built upon. Yet, until very recently, not a vestige of Roman masonry could be pointed to. The walls, to a long extent, carry a promenade like those of Canterbury, but the facings on both sides are Mediæval and modern. The western gateway was standing in the last century, and I gave an engraving of it from a drawing in the British Museum.* Still, visible remains of the Roman walls evaded my eye until very recently, when my friend Mr. John Harris introduced me to a very fine bastion, and the curtain wall in his brother's garden in St. John's-street, so surrounded by houses as to be entirely concealed; and, I believe, it was hitherto perfectly unknown. Of course excavations would have laid open at least the foundations of the original masonry at almost any point, but I have no opportunity of making them.

One of the triumphs of archæology is the discovery that the walls of many Roman towns are not the original walls, which were more circumscribed. They are often found to be built with the materials of large and superior edifices, and sepulchral monuments, indicating two distinct periods of time: one, in which greater splendour prevailed; the other, the downfall of the towns, and a reconstruction on an extended scale. This has been shown in London and in many Roman towns in France, Germany, and Italy. At Canterbury it appears to have been likewise proved in the excavations made by Mr. Pilbrow † a few years since. This explains why sepulchral interments are found occasionally within the later walls. They were on the outside of the earlier, but became enclosed when the circumvallation was extended. I saw in an almost central part of the City of London a skeleton in its grave with a coin of Domitian in its mouth, an important witness in the matter under consideration. Mr. Brent mentions Roman interments within the walls of Canterbury. If we could summon coins from these burials they would probably, like this in London, be of an early date.

The state in which the Roman walls of most of our towns is found at the present day is, I think, to be easily understood. That they were not overturned by the Saxons is obvious. They had no reason for wishing them to be pulled down, and the charters of the Saxon kings continually refer to their preservation in the reservation made in grants of land to the Church, of the legal dues for their reparation, and for the building of other defences. When the Danes, early in the eleventh century, besieged Canterbury, the city walls held out against them full twenty days; and, but for treachery, might have entirely repelled them.* It is probable that portions were then undermined and large masses thus overturned, as we find them at Pevensey and other places; but the denudation of the walls for the worked facing-stones does not savour of hostile assaults, but of the slow and more certain license of times of peace. When building of the walls of Roman towns in the Middle Ages is recorded, we must consider that reparation is meant; and this, probably from municipal neglect, seems to have been often needed.

The question of the date and original character of the walls of Canterbury would soon be answered, in the only possible way, by laying open the foundations and thus seeing what remains of the facing-stones and the nature of the core. This necessary research I proposed to the Congress of the Archæological Institute a few years since, but it met with no success; at the Congress of the Association it was not thought of. But such sessions are not the time for works requiring time and individual attention and experience. Mr. Brent himself would be the man of all men. But hear what he says in reference to attempted excavations at the site of the Worth Gate, which, to me, from Stukeley's drawing copied in "Canterbury in the Olden Time," appears to have all the requisites of Roman work. "I applied also," says Mr. Brent, "to be permitted to excavate, at my own expense, restoring all things to the condition they were in previous to my undertaking the work, the supposed site in Castle-street of the ancient Worth Gate, extending about one-third across the road, as it might decide an important matter in dispute; but I was refused permission by the city authorities, as they saw 'no public utility in it.' On the same ground Westgate was condemned to be demolished."

To Mr. Brent is due the discovery of a very perfect part of a Roman wall, constructed with tiles, which has belonged to some building; but whether private or public, it is impossible to say without making excavations. It seems to have been noticed by no one but himself. It adjoins or abuts upon the old ruined church of St. Pancras. As it is private property, which would be improved by excavations, the obstructive plea of "no public utility" will, it may be hoped, be set aside by that of some private benefit.

New Bridge over the Lee, Cork.—A swing bridge is now being erected across the Lee, the Corporation and Harbour Board of Cork jointly paying for it. The *Irish Builder* gives a view and plan of it, and says that it has been designed by Mr. Fiddler, C.E., of London, and the contract was taken by Mr. Alexander Rooney, C.E., of Queenstown, at 16,400*l*. Mr. Rooney has just erected the temporary wooden bridge (a separate contract), and is already working with his accustomed energy at the permanent structure. The ironwork is being supplied by the Stockton Forge Company, Stockton-on-Tees, the same firm who recently executed a swivel bridge of 80 ft. span for the Great Northern Railway Company near Hartlepool. The new bridge (which, we believe, it is proposed to name after the founder of the City of Cork, St. Finn Barra) replaces one built by the firm of Sir Thomas Deane & Co., and called after the Marquess of Anglesea, the then Lord Lieutenant of Ireland. It was a handsome architectural structure, well suited to its time, but much too small for the growing requirements of the shipping trade, and the lifting apparatus connected with it was a serious impediment to the road. Mr. Robert Walker, jun., architect (who is the local representative of Mr. Fiddler), superintends the work conjointly with Mr. Phillip Barry, C.E., harbour engineer.

* "Report on Excavations made at Pevensey," p. 30.

† Supposed by Soc. Ant. Lon. and everybody to be mediæval!—"Archæologia," vol. xliii., p. 151. The coffin found in Bridge-street, just without the walls, is Roman. Mr. Pilbrow kindly gave me a drawing; but, by accident, I have only just been able, from comparison, to speak positively on it. The ornaments are so identical with those on the Irchester example as to leave no doubt of its being Roman.

* Florence of Worcester, A.D. 1011; and the *Saxon Chronicle*.

THE DECORATION AND FURNITURE OF TOWN HOUSES.

AT the Society of Arts, on Monday evening last, Mr. Robert W. Edis, F.S.A., delivered the first of a course of six Cantor lectures, taking for his subject "The Decoration and Furniture of Town Houses." There was a good attendance, including a number of architects.

The lecturer commenced by stating that he was quite aware that the subjects he had chosen had, in the last few years, been talked and written about almost *ad nauseam*. For some years past he had given them his special study, and in the various suggestions he was about to offer, he was desirous of putting forth no dogmatic rules, of laying down no stringent laws from which there should be no departure, but rather of offering some practical hints to those who were seeking to depart from the general commonplaceness and vulgarity of design in decoration and furniture of modern houses. He did not desire to enter into any battle of styles, believing that true beauty and art form were dependent upon no particular style, and that in the houses they lived in it was first of all essential that everything should be as fitting as possible, and that extravagance of all kinds, or so-called "high art," should be subservient to comfort, truth of construction, utility, and general convenience. He impressed upon his hearers the desirability of having everything about them beautiful in itself and fitting for its special purpose; that however commonplace the object, it should be good in form, design, and colour; and that the present craving after artistic work in decoration and furniture should not degenerate into any set fashion of form or colouring, which, under the clap-trap denomination of "high art," was utterly false and unreal. He presumed that they did not want to make show places of their homes in which the fashions of an hour should be exemplified in the various monotonous dreariness of sage greens and peacock blues in papering, or in quaint eccentricities of design and form in furniture, and which, in a few short years, would be looked upon as crude and tasteless. In this country, where the love of home life and its teachings of domestic comfort and peace especially obtained, all questions of decoration and furniture must necessarily be more or less influenced by these conditions, and they could not expect, in an age in which there were so many causes to influence opinion, to obtain any special unity of taste, or to have the strong harmonious feeling which brought about the great schools of religious painting in the Middle Ages. It was the fashion amongst a certain number of artists of the present day to deny all modern art, and to seek for ancient examples on which to found their ideas of decorative art in the present day; but this, he thought, arose from a feeling of shame at their own incompetence, and a desire to slur over their own ignorance by feeble attempts to copy the art of other countries. The work they had to do to-day was to adapt the art-work in their homes so that it should be beautiful, fitting, and suitable.

Having referred to the influence of schools of art on design, the lecturer said that the various exhibitions in this country and on the Continent in the last few years had exercised an immense influence on the taste, not merely of the public, but of the workmen in all the crafts of British industry, more especially associated with the industrial art of the country. Too much praise could not be given to the Society of Arts for the conscientious way in which they had for long years steadily sought, by all means in their power, to foster and encourage the cause of art and science, and from their exertions and initiative had sprung most of the schools of practical art teaching throughout the country. In praising the present schools, however, he took exception to making students work continually upon designs in which there was an absence of all true artistic feeling, and of beauty or life, and which tended to engender a stiffness and conventionality of treatment in all art work. All this was machinery work of the hand, and lost all trace of human mind or thought; for if art-work was worth anything at all, it could not lie in the production of slavish repetitions of some set patterns, but in the skilful and artistic rendering of ornament in which there should be no everlasting sameness. They must take care that so-called "art decoration" did not degenerate into the feeble prettiness of ignorant designers, into the fashion of so-called "art papers," or the flimsiness of furniture imitated or copied from Japanese or Eastern examples, and having no element of real culture or imaginative power of mind associated with skilful and loving work of hand and eye. If they were to have decoration, let it be of the best kind, for the houses they lived in were, after all, the main teaching of their lives, and he was confident that no amount of outside teaching could help forward the love of beauty and truth in form and in colour so much as the proper and decent arrangement of the rooms and belongings which were continually before them.

The subject of house decoration, until quite recently, had been signally uncared for. It was unfortunate that they could not be content to study the art-work of other nations without seeking to plagiarise from it, but the art-workers of this country were no more able to imitate those attributes one admired than they could fly. They might receive a higher and better influence in decorative taste by studying the art-work of Oriental nations, but they could never at any time attain to artistic character of work by slavishly copying the design and colouring of artists who worked under totally different associations and traditions. It was lamentable to notice, in the Indian collection at the last Paris Exhibition, the numerous examples of mongrel work, the result, as Dr. Birdwood, in his valuable handbook, truly said, "of the influences on Indian art of English society, missionary schools, schools of art, and international exhibitions, and, above all, of the irresistible energy of the mechanical productiveness of Manchester and Birmingham, and Paris and Vienna." This was especially noticeable in the Prince of Wales's collection in the way in which the native chiefs and princes, in many instances despising their own arts, had literal copies executed in solid silver of the latest Birmingham imitations of Indian pattern teapots, paper-weights, and centre-pieces. It was impossible to slavishly copy the distinct and indigenous varieties of Oriental decorative arts with any satisfaction in the decorative work of this country, although it was quite possible to learn much from their exquisite design and treatment, and to use and adapt some of their work in the decoration and ornamentation of our own homes. If a man might be judged by the friends he had, surely much more so might his artistic culture and love of beauty be arrived at by the nature of the things with which he surrounded himself in his home. It was unfortunately true that in many houses they still found decoration and furniture, in which there was no element of beauty, in which costliness and vulgarity seemed to run together, while some of the modern teachers run into eccentricity and grotesqueness of design and colouring, forgetting that in art, as in every-day life, eccentricities, either of design or colouring, were to be avoided, and that, as in the well-dressed woman of their acquaintance, so in all art decoration, they should be able to see general harmony and simplicity of effect, in which there should be no staring patterns or colours.

The fittings, hangings, and general furniture of a room should not only be fitting and suitable for their various uses, but in harmony with the general decoration of the walls; and this decoration should depend, not upon any fashion or style, but on the general appreciation and adoption of colour and beauty of form, and, in that, ensuring a homelike feeling made more beautiful and interesting by the imaginative taste and daily art-education of those who lived in their homes. Depend upon it, the decoration of their houses was not a mere thing of fashion, but a constant recurring pleasure, and, beyond all this, to a great extent the absolute art-education of all who dwelt within or visited them in their homes. Since the latter days of the Renaissance, when practically set in the decadence and fall of all real art, there had been sundry fashions in architecture, painting, and decoration, which had had a short and fitful life, giving way, like all fashions which were grounded on no love or real feeling, to the caprice and taste of the last new-comer. From the end of the sixteenth century they had gone from Classic to Gothic, and from Gothic to Queen Anne, the latter fashion having developed much of really good art-character, and which, after all, properly applied, was really bringing them back to old English work. In these days of luxury and artistic proclivities, large sums of money were spent upon internal decoration and furniture without much idea of taste or common sense. Money was frittered away in pretentious extravagance in the shape of gaudy decoration or elaborately carved and inlaid furniture and hangings of the most expensive character, which had little or no real claim to be called artistic or beautiful. Now-a-days they were apt to be content to accept the dogmas of a particular school as correct and infallible, and to forget that the true art-decoration of houses was not to be made up of fashionable wall-papers or furniture made after a particular pattern. Extravagance of cost was not necessary for the fitting up of their houses, for he held that furniture of thoroughly good art design, comfortable in shape, and sound and good workmanship, might be made without any extravagant outlay, and that plain, polished, or painted deal furniture of really good design was better than all the elaboration of Chippendale fretwork or Queen Anne ornamentation. The pretentious imitation of good work in furniture was in every way to be condemned. He could conceive nothing more terrible than to be doomed to spend one's life in a house furnished after the fashion of twenty years ago. *Vexatio dat intellectum*, and it was not to be supposed that any true knowledge of decoration and real feeling for things artistic could be obtained all at once; it was only by a constant study of nature and of the really beautiful things of art that the eye became educated to understand and appreciate beauty of form, outline, and colour. Foremost in the rudiments of real art, it must be borne in mind that absolute truth must be the foundation of all good works; that all ornaments should consist of the real construction of the building; that this in itself should be beautiful; and that decoration itself should not be constructed for mere purposes of show and effect, but should possess in itself fitness, proportion, and harmony of design and colouring. All striving after imitation and unreality was utterly at variance with good taste in decoration, as in life. In decoration and furniture, the great aim of the designer should be simplicity and appropriateness of form and design, with harmony of colour, and to show that the cheapest and commonest things need not be ugly, — that truth in art and design need not of necessity involve costliness and lavish expenditure. Fitness and absolute truth were essential to all real art, and be it remembered that "design is not the offspring of idle fancy; it is the studied result of accumulated observation and delightful habit." A careful regard to this would make their homes pleasant places, where the educated eye might look around without being shocked and offended by gross vulgarity and gaudy commonplaceness. There was no real reason why painted and varnished deal or other soft wood furniture should not be made at a cost within the means of all.

For more than a hundred years, the fashion of furniture, like that of the master art of architecture, had been continually changing, and from time to time they had had works which had either been adapted or imitated from ancient Greek or Roman examples, or, in later years, had based their form and shape on Mediæval specimens, degenerating as a rule into vulgar and meretricious commonplaceness. If not an age of luxury, the nineteenth century was essentially one of comfort. As an architect he regretted that in these days the designing of furniture was, as a rule, handed over to the upholsterer, and that the houses they built were oft times filled with articles utterly incongruous in design, bad in taste and form, and often utterly commonplace and uncomfortable.

In conclusion, he said that he had briefly sketched out the history of furniture, but with no idea of suggesting its influence upon their modern work, in which different necessities and different habits required different treatment, and in his future lectures he proposed to offer suggestions for the economical treatment of decoration and furniture, and the adaptation of both to modern necessities. He hoped that styles, small and puerile, would give place to manners great and manly, and that their English art in decoration and furniture might eventually return to those ways in which truth and study of nature, combined with knowledge of use and suitability, were the chief attributes of all good and pure design, and that the fine arts, as applied to the internal decoration of their homes, as well as to architecture, sculpture, and painting, might be felt as the higher intellectual agents in fostering and promoting the well-being of man.

The next lecture, to be delivered on Monday next, will treat of the floor, wall, and ceiling decoration.

THE FRACTURE OF CAST IRON: VISCOSITY AND REGELATION IN METALS.

CIVIL AND MECHANICAL ENGINEERS' SOCIETY.

At a recent meeting of this society, a paper on this subject, by Mr. James Love, F.R.A.S., was read. It was supplementary to a paper on the fracture of wrought-iron, laid before the Society by the author last year, and printed in the *Builder* at the time.*

If (said the author) we break a piece of pig-iron, and examine the fractured surface, we find that it is made up of a number of small facets. These facets have, while the surface is fresh, a very high degree of polish, and they give to the surface an appearance very much resembling that which is presented by the fractured surface of wrought-iron when it breaks by cleavage. A microscopical examination of the facets, however, will show that they differ very considerably from the facets of wrought-iron. In the first place, every element of the surface in a cleavage fracture of wrought-iron is a plane, but the facets in the broken surface of pig-iron are curved. Secondly, the facets in wrought-iron show the metal itself; but in pig-iron the metal is covered with a thin film of graphite. It is curious to observe that, break the pig-iron where you will, it always shows this film of graphite; and in some fractures little bits of the metal may be seen hanging loosely to the surface. These bits may be removed with a penknife, or sometimes with the finger-nail; and on examination they are found to be completely surrounded with graphite. It would thus appear that the pig is built up with small particles of iron cemented together with graphite, somewhat after the manner in which a mass of masonry is built up with stones and mortar, and that the strength of the pig is not the strength of the iron, but of the graphite cement. This graphite is the uncombined carbon of cast-iron. It becomes more and more combined with the iron every time the metal is re-melted. Re-melting makes the metal harder and stronger; but the strength very soon reaches a limit beyond which remelting makes the metal weaker; and the hardness goes on increasing until all the carbon is combined, when the metal is very hard and very brittle, and is known as white iron.

The facets of pig-iron vary in size according to the quality of the pig. When pig-iron has been remelted and recast, the fractured surface of the casting is greatly altered in general appearance. An increase of microscopic power will, however, show that the facets are still there, retaining their curved shape, although they are very much diminished in size. As well as being smaller, they look towards a greater number of directions in a casting than in pig, and give the peculiar roughness to the fractured surface of the casting. They are smaller near the sides than near the middle of a casting; and they constitute what is called the grain of cast-iron, their size determining whether the metal is open and coarse grained, or close and fine grained. Besides the roughness due to the size and arrangement of the facets, the surface of fracture possesses a general form which is not dependent upon the facets. If we imagine all the little projections on this rough surface to be filed off, and the metal thus removed to be used in filling up the little depressions, we shall have a mean surface, the form of which is not constant. I had observed, whilst breaking cast-iron bars transversely, that this general form of the fractured surface was sometimes flat and at other times curved; and as neither the one form nor the other appeared to be due to any flaw or unsoundness in the bar, I felt curious to know what determined the form. To gratify this curiosity I have made observations on a number of bars; and without pretending to have discovered why fracture takes place in the way it does, I have arrived at a few results which may be interesting.

The bars upon which the observations were made were square in section, being 1 in. deep by 1 in. wide, and 3 ft. 4 in. long. Each bar was supported upon two knife-edge bearings, 3 ft. apart, and a weight was lowered steadily upon it midway between the bearings. Three lines were drawn upon each bar, one over each bearing, and one in the middle under the load. When a bar broke the distance between the centre line and the fracture was measured, and it was noted whether the form of the fracture was curved or straight; if curved, the direction of the curve was also noted. Very soon it was found that the curves were all in one direction, except when interfered with by a flaw in the bar, and as the curvature was sometimes very slight, the following method was adopted for discriminating between straight and curved fractures:—The broken bar was looked at sideways, so as to show the vertical edge of the fractured surface, which would thus appear as a line; then, if it were possible to say from a mere inspection of this line which piece of the bar contained the centre line, the fracture was classed as curved, if not, it was called straight. This method was, of course, used only for those fractures which were very nearly straight; but there were a great many so much curved as not to cause the slightest hesitation. By observing and recording in this manner, it was found that a great many more bars broke out of the centre than in the centre; and that those which broke in or near the centre showed a fracture that was straight and at right angles to the upper and under surfaces of the bar; but those which broke at a distance from the centre had, in a great many instances, a curved fracture of the following shape:—Starting as a perpendicular from the under-edge of the bar, the curve would bend very slightly towards the load, and would not deviate much from the perpendicular until it reached a position a little more than halfway from the under to the upper edge, when it would begin to bend more sharply, increasing its curvature as it approached the upper edge of the bar, to which it would tend to set itself parallel. The curvature was usually greatest in those fractures which were furthest from the centre of the bar; and the curve was always concave towards the centre and downwards. . . . Even a large number of 1-in. bars would not show so great a difference as would a number of bars 2 in. deep; for in 2-in. bars the lower end of a fracture will, in some cases, be more than 1 in. farther than the upper end from the centre of the bar. A fracture which is not very uncommon in 2-in. bars is of the following shape:—Beginning at the under edge, some 4 in. or 5 in. from the middle, it will travel part of the way across nearly perpendicular to the length of the bar; it will gradually increase its curvature until it becomes very sharply curved; it will then gradually flatten its curve and travel along near the upper edge until it reaches a point 1 in. or 1¼ in. nearer the middle of the bar, when it will suddenly turn a right angle, and come out at the top, giving a rounded corner to one piece, and to the other a long taper lip with a square end about ¼ in. thick. A fracture of this shape bears a rough resemblance to a hyperbola, having one asymptote along the upper edge of the bar, and the other perpendicular to it. But we have no 2-in. bars in this series. The following table shows the number of 1-in. bars upon which observations have been made. The first column gives the number of bars broken; the second gives the number of bars which broke with a straight fracture; the third, the number which broke with a curved fracture; and the fourth gives the distance between the fracture and the centre line, as measured along the under side of the bar:—

Number of bars broken.	Fracture straight.	Fracture curved.	Distance from centre.	Number of bars broken.	Fracture straight.	Fracture curved.	Distance from centre.
			inches				inches
28	28	0	0	2	0	2	2½
35	29	6	¼	4	0	4	2½
41	26	15	½	2	0	2	2½
37	20	17	¾	2	0	2	2½
24	8	16	1	1	0	1	3
30	19	11	¼	1	0	1	3½
25	11	24	½	1	0	1	3½
24	4	20	¾	1	0	1	3½
22	0	22	1	1	0	1	3½
15	2	13	1¼	3	0	3	3½
20	0	20	1½	2	0	2	3½
11	0	11	1¾	1	0	1	3½
14	2	12	1½	1	0	1	4
11	1	10	1¼	1	0	1	4
9	0	9	1½	1	0	1	4
3	0	3	1¾	1	0	1	4
6	0	6	2	1	0	1	4½
1	0	1	2¼	1	0	1	5
3	0	3	2½	1	0	1	5½
		Total	396		151	245	—

The form of fracture described above may be very well shown by breaking a stick of sealing-wax transversely. It may also be shown by breaking a rod of glass transversely; and it may very often be seen in pieces of broken sheet glass. Take a piece of ordinary sheet glass, break it into two pieces with a transverse pressure, and then examine the fracture. It will, in many cases, be found that the surface of fracture is curved; one of the pieces will have a square corner on one side, and a rounded corner on the other, whilst the other piece will have a square corner on one side, and a very acute corner on the other side. This acute corner is sometimes drawn out to a very thin sharp edge; it is this sharp edge which makes broken glass so dangerous to handle. Closer observation will show that the square corners occur on that side which was in tension while the glass was under pressure; the rounded and the acute corners being on the compressed side. This curved form of fracture will not be observed in all cases, for it depends upon the position of the fracture with respect to the point where the pressure is applied.

Since this form is assumed by such widely different materials as cast-iron, sealing-wax, and glass, we may conclude that it is determined by something other than the material. What, then, determines this form of fracture?

Dynamicians tell us that when fracture takes place its direction must be along the line of least resistance, or perpendicular to the line of greatest traction, or a resultant of the two. It is very natural to suppose that these several lines would, in a square bar of uniform section, be all together at the centre of the bar; but the observations show that this is not usually the case, and that fracture takes place away from the centre more frequently than at the centre. Even then it might be supposed that the fracture would be straight, and perpendicular to the sides of the bar, that being the shortest line, and, therefore, other things equal, the line of least resistance. But it is not so. Yet, whatever may be the position and direction of the line of fracture, it must be concluded that that line is the resultant of the line of least resistance and the perpendicular to the line of greatest traction. Let us see whether any relation can be found between the line of fracture and the distribution of stress.

Some years ago Sir George Airy made some researches into the distribution of stress in solid rectangular beams. He considered the stresses in a thin vertical lamina of a horizontal beam, supported at each end, and carrying merely its own weight. Such a beam would, of course, be carrying a uniformly-distributed load. By these researches he was led to the conclusion that the stresses were distributed through the beam along curvilinear paths. The curves for the two sets of stress are similar, but opposite; that is to say, the curves representing the tensile stress are concave upwards, while those representing the compressive stress are concave downwards, and the two sets of curves cross each other. These curves are shown in a diagram in "Rankine's Applied Mechanics," p. 342, fig. 146, sixth edition, and are there called lines of principal stress. Some time ago I attempted to trace out these lines of principal stress with the aid of polarised light. To do this I used a glass bar, rectangular in section, 2 in. deep by 1 in. thick, and 1 ft. long. This was screwed into a frame, and pressure applied to it in such a manner as to imitate a distributed load. It was, while in this condition, put in the dark field of the polariscope in a known angular position, and a series of observations made and recorded. The angle was then changed and another series of observations made. This was repeated until a large number of points were obtained and laid on paper. The result showed that the two sets of curves crossed, that is to say, the curves representing tension crossed those representing compression at right angles to each other in all parts of the bar; and that there was no part of the bar without stress.

Now, then, how will these lines of principal stress help to explain the direction of the line of fracture? This way. Firstly, other things equal, the line of least resistance would be the shortest line across the bar, and would be perpendicular to the sides. The fracture would tend to follow that line. Secondly, other things equal, the line of fracture would tend to set itself at right angles to the lines of principal tensile stress. Now any line other than the centre line crossing these curves at right angles, would itself be curved, and would be concave towards the centre and downwards. It would, in fact, coincide with one of the lines of principal compressive stress. The fracture, then, tending to follow both of these directions, would follow neither, but would lie somewhere between the two; it would be a resultant of the two; and this is where observation finds it, for although it is curved in such a manner as to have its

* Vol. xxxvii. (1879), p. 269.

concave side directed towards the centre of the bar and downwards, yet it is not sufficiently bent to set itself at right angles to the lines of principal tensile stress. When the fracture occurs in the middle of the bar, the line is straight, and perpendicular to the sides, because any tendency which may exist to bend it in one direction is balanced by an equal tendency to bend it in the opposite direction. In this position it is perpendicular to all the lines of principal stress as well as to the sides of the bar. This relation which the line of fracture bears to the line of least resistance and the lines of principal stress may perhaps be made clearer by a suitable diagram, which may be drawn in the following manner:—Make a copy of Rankine's diagram to a larger scale, omitting the lines of compression, and increasing the number of the lines of tension. Now, at a position midway between the ends, draw a perpendicular to the sides of the bar; this line will be perpendicular to all the lines of principal stress, because these lines are, in this position, horizontal; it will also be a line of least resistance; and it will be a line of central fracture. Again, draw on either side of the centre a line of fracture as shown on the plate, or as described above for a 2 in. bar; then, from the lowest point of the fracture, draw a perpendicular to the sides of the bar: this will be a line of least resistance; from the same point draw a line, intersecting at right angles all the lines of principal tensile stress; this line will be curved, and will be concave towards the centre of the bar and downwards. When these three lines are carefully drawn the line of fracture will be found to lie between the other two.

The observation of the three materials, cast-iron, sealing-wax, and glass, so curiously resembling each other in their line of fracture, has led me to inquire whether they have any other resemblance.

All bodies resist distortion. The particles of bodies having taken up certain positions, resist any force which tends to make them take up other positions; there can be no relative motion among them without the absorption of force; and if the force impressed upon them be sufficiently great to partly overcome, and yet not sufficient to completely overcome, the resistance, the particles return to their first position. The property which enables them to return is elasticity. By experiments on the elasticity of solid bodies it has been found that when the bodies have been distorted they do not completely return to their original shape after the removal of the distorting force; hence it is said that solids are not perfectly elastic bodies. Now this incomplete return shows that bodies possess another property which, in this phase at least, is opposed to elasticity. It does not, however, oppose elasticity in all its phases; for in its resistance to a distorting force it helps elasticity against the force, but when the force is removed it opposes elasticity, and prevents the body from returning to its original shape. It appears, then, that one of the functions of this property, which bears the name of viscosity, is to resist motion, or to absorb motion. This is also one of the functions of elasticity, for elasticity can absorb motion, but whatever motion it absorbs it can give out again as motion. In this way elasticity may be regarded as a reflector of motion. Not so, however, with viscosity; it cannot reflect motion; for having absorbed motion it cannot give it out again in the same form. Viscosity utterly destroys motion as such. But, although the motion disappears, no force is lost, for it is given out in another form; for viscosity has the power of transforming molar motion into molecular motion, or, if the terms be preferable, of converting ordinary visible motion into heat. So that if motion be put into a viscous body, its temperature becomes raised. In this respect, viscosity resembles friction. In fact, it may be regarded as a kind of intermolecular friction.

Viscosity is possessed by fluids as well as by solids, for it is found in water and other liquids, in air and other gases; and it is even supposed to exist in the ether of space, the celestial ether which has been so triumphantly pointed to by the physicist as an example of a perfect fluid—a fluid which offers no resistance to a change of shape. Modern astronomy has shown that bodies of small mass, such as comets, are retarded in their motions through space: they do not come to their perihelion at the calculated time; hence it is inferred that they are ploughing their way through a resisting medium, and that the ether is a viscous fluid. The astronomer now turns round upon the physicist, and tells him that his perfect fluid is little better than so much diluted treacle.*

THE HERMES OF OLYMPIA.

LAST week the Elgin Room of the British Museum received the accession of a plaster cast of the Hermes lately found at Olympia. This has been forwarded from Berlin. The Germans having been at the charge of the excavations which brought this remarkable fragment to light, possess a mould of it, from which this cast was taken, the original marble remaining with the Greeks. It consists of the head, torso, and thighs, with the left arm perfect up to the fingers, and the right to the elbow; all which is in a good state of preservation. The legs, however, are broken off at the knees, so that the pose cannot be exactly realised. This, however, is evidently that of a figure resting partly by means of its left arm on a tree, from which some drapery depends, which is charmingly wrought. In this semi-resting attitude it resembles the young Faun of the Capitol, which is also said to be from a design of Praxiteles, to whom also the Apollo Sauroctonos is attributed, which likewise rests partly on a tree. This pose, therefore, appears to have been a favourite one with this sculptor, to whom this Hermes of Olympia is ascribed on the authority of Pausanias, who speaks of such a statue existing in his time, at the very spot on which this was found. The head possesses a family likeness to the features of the many other sons of Zeus, and one may not marvel, therefore, that it resembles that of a young Hercules, especially in the great prominence of the centre of the brow. To no one of ancient heads, however, does it bear a greater likeness than to the Meleager of the Vatican, with the boar's head and the dog. One of the incidents of the life of Hermes, or Mercury, was, according to Ovid, that he took charge of his infant brother Dionysos to convey him to his aunt Ino, and in this statue a fragment of a figure of the child, of very diminutive proportions, seated on the arm, is supposed to be conclusive as to the theme of the work. Probably, however, investigation will discover some gem which may further illustrate the subject. There is much beauty in the form, which in some respects is somewhat soft and feminine, the sway afforded by the semi-reposing attitude favouring this. The cast is of much interest, and has some technical peculiarities, which may well invite the attention of the artist and student of Greek art. It has, however, a marked difference of style from the Parthenaic marbles, and therefore does not possess the same pertinence in the Elgin Room as the cast of the Venus of Melos, lately presented to the Museum, which is calculated to be of much value to the student by the side of the relics from the Parthenon.

BUILDERS' CLERKS' BENEVOLENT INSTITUTION.

THE experiment tried in April, 1879, of arranging a dinner in connexion with this deserving charity, proved so successful in awakening interest in the aims and objects of the Institution, that it was repeated on Tuesday night, and will henceforth be an annually recurring festival. The dinner was held, as before, at the Guildhall Tavern, Gresham-street, and about 100 friends and supporters were present. Mr. S. Taprell Holland (of Holland & Hannen) occupied the chair, and was supported by Messrs. T. F. Rider (ex-president), G. Plucknett, C. Fish, Frank May, G. H. Trollope, C. B. Walters, Wm. Colls, Howard Colls, C. E. Lacy, Eckstein, Doulton, Moser, Major Brutton (secretary, Builders' Benevolent Institution), and other friends of and subscribers to the Institution. Major Brutton and Capt. Trollope responded to the toast of the "Army, Navy, and Reserve Forces." In proposing the toast of the evening, "Success to the Builders' Clerks' Benevolent Institution," the President said he did so with diffidence, as there were those sitting at the table who had been connected with it from the beginning. He referred especially to Mr. Bishop, who drew the first cheque the Institution received. But there were probably also some who were attending the annual dinner for the first time, and for their benefit older friends would perhaps bear with him while he gave a brief outline of the history of the Institution. It was founded in 1867, through the personal exertions and generosity of Mr. Thomas Peto Ward, to whom builders' clerks owed the homage due to a founder. Mr. Ward was himself a builder's clerk, and his intimate knowledge of the requirements of his fellow-workers had often stood the Institution in good stead. He enlisted the sympathy of many friends, including the late William Lawrence, M.P., who, in 1867, was elected first president; but little was done beyond collecting subscriptions and laying the foundations. In 1868 Mr. William Henshaw became president, and the Institution for the first time dispensed a small amount of relief, having now been publicly recognised. In 1869 the Institution got into working order, and dispensed the sum of 66*l.* 3s. 4d. in relief. There was no flourish of trumpets at the start; the commencement was very modest, but year by year the Institution had grown in strength and repute, as all permanently useful organisations should do. Ten other years passed away, and then, in 1879, under the genial presidency of Mr. Thomas F. Rider, it was determined to hold a public dinner. Last year they were so successful that 179*l.* 5s. was distributed in relief and in pensions, and a second presentation for twenty-one years to the Orphan Working School was purchased at a cost of 212*l.* 10s., making a total of 441*l.* 10s., a sum which well contrasted with the amount spent in 1869. This advance in ten years was satisfactory, but there was still work in store. There were two or three most deserving cases of widows of clerks to builders requiring immediate aid, to whom temporary relief had been thus far afforded. One would in June receive a pension, but it entirely depended on the response of that evening whether the others would have to wait for a while. The present position was, that the Institution granted one pension of 25*l.* a year to a clerk to a builder who was incapacited for or past work, eight pensions of 20*l.* each to the widows of clerks, and also supported at the Orphan Working School two orphan children. Very much remained to be done, and he pleaded earnestly on behalf of the widows and orphans of those who had borne the heat and toil of the battle with those seated at the table, especially urging upon builders' clerks that, if they wished to enjoy the luxury of helping others, no nearer claim, nor more useful charity, could be brought home to them, while it, in consequence of the ten votes allowed for every guinea subscribed, formed a species of insurance.

In response to this appeal, the secretary (Mr. H. W. Wheatley) announced, at a later stage of the proceedings, that 217*l.* 17s. 6d. had been promised in the room as donations, and 33*l.* 11s. 6d. as new subscriptions, stating a total for the evening of 251*l.* 9s. added to the funds, an announcement which, being double any previous sum received, was greeted with cheers. The donations included twenty guineas each from the President, from Messrs. Holland & Hannen, and from Messrs. Mowlem & Co.; and ten guineas each from three other firms.

Other toasts followed, and a pleasant evening was spent.

FIREPROOF FLOORS.

SIR,—Your professional and practical readers will excuse me for drawing their attention to the fact that I intend exhibiting at the Exhibition of Building Appliances, to be held at the Agricultural Hall next week, amongst other things a floor of concrete, constructed on the system I have recently advocated of bringing the materials on the ground dry and fit for use.

I shall have an assistant in attendance, who will give all information as to strength, cost, &c., and I confidently invite the attention of your readers to it.

W. H. LASCELLES.

BOILERS AND CISTERNS.

SIR,—Having lately had a kitchen range fixed, with a cold-water cistern made of galvanised iron (and placed at a distance of about 16 ft. away from the boiler), a most disagreeable noise has been produced, and when the water boils the noise caused in the cold-water cistern is such that conversation is quite inaudible. Since the workmen have left, however, I have had a syphon attached to the supply-pipe, also an air-pipe, but to no effect. Can any of your readers inform me of a method whereby the noise can be obviated?

A. C. S.

Dr. Schliemann has written to the editor of the *Golos* stating that he has finished the excavation of Troy, and that there are remnants of several cities clearly discernible underneath the one immortalised in the "Iliad."

* To be continued.

THE BELFAST ACADEMY.

The memorial-stone of the new buildings for the Belfast Academy was laid on Tuesday last. The most striking feature in the new buildings is the large square tower which is placed in the centre of the façade facing the Cliftonville-road. The main entrance placed beneath it is deeply moulded, some of the mouldings being enriched with carving. The spandrels of the arch at each side have carved shields, one bearing the date of 1785, the year in which the Academy was inaugurated, the other the date of 1880. Above this is corbelled out a large oriel window, with its lower members carved with foliage. The inner hall is of spacious dimensions, and is abundantly supplied with light from large mullioned windows, which are filled with tinted cathedral glass, in geometrical patterns. On the left-hand side of this hall access is obtained to the mathematical school, with its apparatus room, laboratory and master's room, the writing-school, master's-room, and the bursar's office. On the right hand are situated the English school and master's room, the Classical school, master's and waiting-rooms. At the extreme end of the hall is placed a luncheon-room for the pupils.

The upper hall is the same size as the lower, and gives access on the left-hand side to four class-rooms, master's-room, library, and board-room. The common hall occupies the other side of the first-floor, and will seat about five hundred persons. The second-floor is arranged with a view to ultimate use for boarding purposes. One end will be occupied at present as a museum and gallery of fine arts. It is intended that the head-master's residence shall communicate directly with this floor. The pupils will be admitted to the various school-rooms by the circular staircase turrets, which are arranged at the outer angles of the building, and in immediate communication with the lavatories, &c. The whole of the exterior walls are executed in Scrabo sandstone, with tooled dressings of the same materials. The whole building is relieved by richly-carved string-courses at different levels. The junction of roof and wall is concealed in front by an embattled cornice, resting on an elaborately moulded and carved eaves-course. The tower is also finished similarly, whilst the chimneys and pinnacles have smaller cornices. The works are being carried out by Messrs. Dixon & Co., Clifton-street, and the architects are Messrs. Young & Mackenzie. The buildings, when completed, will involve an outlay of 10,000*l*.

EASTBOURNE TOWN-HALL COMPETITION DRAWINGS.

In answer to the advertisement issued, twenty-two sets of designs were sent in, comprising 145 drawings, by the 15th of February, 1880. The committee, who commenced their labours on the 18th of March, after several meetings, and having given the matter their consideration, selected five designs from which to choose the first and second premiums, and finally selected two designs as follows:—First premium, motto "Forward," 75*l*.; style, Renaissance; second premium, motto "Labore," 50*l*.; style, Gothic; and recommended the Local Board to adopt them. At a meeting of the Board held on the 5th inst., at which the five selected designs were exhibited, it was resolved to adopt the committee's report; and on the chairman opening the sealed addresses of the competitors, it was found that the author of the set marked "Forward" was Mr. Wm. Tadman Foulkes, Town Hall-chambers, New-street, Birmingham; the authors of the set "Labore" were Messrs. Thomas D. Barry & Son, Commerce-court, Liverpool.

The Board were assisted in their labours by Mr. E. W. C. Schmidt, "building surveyor" to the town, who made a report upon each set of designs. It was resolved to throw open the whole of the designs to public view at the Board's Offices, Meads-road, between the hours of two and five in the afternoon, up to the 19th inst.

The set marked "Forward" is a comprehensive design in the Renaissance style, capable of being carried out in sections, or as a whole, and embracing all the requirements of the town for the next fifty years. There are four principal entrances from the main street,—one for the Local Board offices, one for the public, one for the police, and one for the magistrates. On the ground-floor are the Local Board offices, police department, cells, and fire-engine house, with range of cart-sheds, blacksmiths' shops, stables, &c., at the back. On the first floor there are a board and justices' room, retiring-rooms, committee-room, clerks' rooms, strong-room, lavatories, &c. On the second floor are bedrooms for constables, caretaker, &c. The whole is surmounted by a clock-tower.

The design "Labore" is in the Gothic style. The cells are placed in the basement beneath the justices' room. There is one principal entrance, beneath the clock-tower. On the ground-floor is placed the board or justices' room, retiring-rooms, committee-rooms, lavatories, clerks' rooms, strong-room. On the first-floor are surveyors' and building surveyors' rooms, caretaker's rooms, lavatories, w.c.s, &c. There are two entrances at the east and west ends of the buildings, the entrance to the cells being in the rear.

The following is a list of the designs submitted:—

1. "Experientia," Queen Anne.
2. "Eastbourne, 1880," Gothic.
3. "Denzil on Shield" " "
4. "Fortis," Renaissance.
5. "Sussex" Classic.
6. "Alpha X.," Gothic, *A.*
   " " *B.*
7. "Spero" "
   " Coloured Elevation, Gothic.
8. "Palma Perseverentia," Classic.
9. "Brick and Stone," Renaissance.
10. "Gardes Bien" Gothic.
11. "Justitia" "
12. "Unit" "
13. "Athenæum" "
14. "Cavendo Tutus" "
15. "Prosperity to Eastbourne" "
16. "Meum" "
17. "St. Valentine," Renaissance.
18. "Tenes," Gothic.
19. "Labore," 2nd premium, 50*l*., Gothic.
20. "Forward," 1st premium, 75*l*., Renaissance.
21. "Beachy Head," Late Tudor.
22. "Faith," Gothic.

PUBLIC BUILDINGS IN BIRMINGHAM.

ALLEGED ARCHITECTURAL MONOPOLY.

At the meeting of the Birmingham Town Council on Tuesday last, Mr. Alderman Collings, M.P., on behalf of the Libraries Committee, moved the approval of the plans for the branch library at Constitution-hill, remarking that they provided for the erection, at a cost of 3,500*l*., of a commodious building adapted for its purpose. The present building was totally inadequate for the requirements of the district, the daily issue being 350, and the average daily readers 800. In regard to an amendment of which Alderman Heaton had given notice, and which objected to the employment of Messrs. Martin & Chamberlain to prepare the plans without the invitation of designs from other architects, he observed the Council would have saved nothing whatever by inviting competition. The amount concerned, 3,500*l*., was so small; it was unusual for a gentleman building a house at that price to go in for competing plans. The committee had done their best to obtain plans most suitable to the purposes they had in view, and he had not heard that in those obtained there was anything not of the best kind. There was also the element of time to be considered.

Alderman Heaton moved the following amendment, pursuant to notice:—

"That the plans for a branch public library in Constitution Hill submitted by the Free Libraries Committee be referred back to them, with instructions to have designs for the building prepared by more than one architect, or firm of architects, in order that the Council may have several plans to select from."

He much regretted the necessity of moving this proposition. He had previously drawn attention to the matter, and he should continue to lift up his voice on the subject, while he remained in the council, for fair-play among the architects generally. He had not one word to say against Messrs. Martin & Chamberlain, and he only moved the amendment in the interest of the other architects of the town. He had previously been answered, when he had raised the question, as in the case of the fire-brigade station, that it was such a small matter; but these small affairs were growing larger and larger, and he must decline to withdraw. There were numbers of architects able and willing to give them their ideas without the expense of a farthing to the Corporation, and the committees would have a better opportunity of selection by being got out of their customary groove. He would suggest that the Council invite plans, by advertisement or otherwise; the competitions would be optional, and the best design might be chosen. There was considerable feeling on the matter outside the Council, and they would find if they did not deal liberally with the profession they would regret it. The committee had not been authorised to prepare those plans, and they ought to have come before the Council and asked whether they were to have plans prepared, and whether they were to be prepared by one firm of architects or by another.

Alderman Biggs, in supporting the amendment, said the Council had, some years ago, passed a resolution affirming the desirability of throwing open their plans for competition, but latterly they had abandoned this principle. Committee after committee had gone to Messrs. Martin & Chamberlain, sometimes without consulting the Council or taking its instructions, and he believed the present was one of those instances.

The amendment was lost, and the recommendation of the committee was adopted.

THE BUILDING EXHIBITION, AGRICULTURAL HALL, ISLINGTON.

This exhibition, to which we have already referred, will be opened to the public on Monday next, the 12th inst., and will remain open for a week: a ridiculously short time. A large number of exhibitors have already entered. The exhibition is divided into five sections, viz., architectural models, drawings, plans, &c.; construction.—bricks, stone, concrete, wood, sanitary appliances in pottery or concrete, and constructive ironwork; engineering—machinery and engineering appliances, taps, valves, hot-water, and steam-heating stoves and metal sanitary appliances; decoration—wall-papers, paints in oils and tempera, window-glass staining and plaster and papier-maché ornaments, encaustic tiles, marble and terra-cotta, and carved woodwork; furniture and portable decorative articles, including busts, pottery, metal-work, turned ornaments in wood, stone, &c. Many of the large metropolitan firms have given the exhibition their support.

ROBBING THE FUTURE.

"One of the most picturesque and characteristic thoroughfares in the world is at the present moment being improved out of existence. Every one who knows Venice will remember the first approach through the narrow little Bocca di Piazza to the great square of St. Mark. Improvement has been busy with the narrow lanes of the sea-built city. The Calle di San Moise is passing through the dreary stage of demolition to the more fatal attainment of modernisation and reconstruction."—*Daily News*, 30th March, 1880.

Rude hands despoil Venetian haunts I've seen
But though my Hope,—yet haunts where wisdom's eyes,
And ardent hearts that throb not now to sighs
Have worshipp'd,—passing glory that has been!
Now craft now murders old, and stands between
My Hope and Art which deep in Venice lies,
And speechless pray'rs from remnant relics rise
To leave them dreaming in their sleep serene.
Oh stay! ye brutal modern hands that thieve
The joys which buried pow'r bequeathed mankind;
You rob not me alone,—my tears conceive
The eyes of days and nights you're striking blind,
The hearts of men you now and yet will grieve
For glories you for ever cast behind.

William Tirebuck.

FIGURE-HEAD OF THE OLD *ST. GEORGE*.

Sir,—In your very interesting and graphic description of the wood-carving in the Royal Albert Hall in your number for the 3rd inst., you have drawn your readers' attention to No. 149 in the catalogue, representing the figure-head of the old *St. George*, and remarked that it would be desirable to know where the rest of the model is. I beg to say that the remainder is in my possession, and in perfect preservation, and I have only detached the figure-head temporarily for the exhibition.

I beg to inclose a description of the model, as it may be interesting to your readers:—

Figure-head of the Model of the old St. George, 110 guns, built in the reign of Queen Anne.—The model, planked in boxwood, has over the stern galleries an alto-relievo in boxwood representing Queen Anne in an open chariot drawn by a lion and unicorn driving over a prostrate enemy; behind the chariot is an armoured figure holding a roll,—a record of the constitution, with a drawn sword in his right hand in an attitude of defence. At either end of the galleries are full-length figures, representing Britannia and Minerva. A shield also, containing the monogram A.R.

The flat spaces outside and under each gallery are decorated with painted copies of Raffaelle's arabesques in the Vatican.

From notes inherited by the great-granddaughter of the builder it is stated that the model cost 3,0*l*., and that the carving was executed by an Italian.

John W. Spread.

27, *Pembridge Crescent, W.*

MASTERS AND MEN.

Liverpool.—A mass meeting of the workmen involved in the dispute in the building trade, to which we made reference last week, was held on Saturday evening, Mr. F. O. Creswell (joiner) in the chair. Mr. J. Cogley (joiner) moved the following resolution:—

"That this meeting, representing all branches of the building trade, consider that the resolution of the Master Builders' Association, as conveyed by their letter of the 2nd inst., is arbitrary and unjust, and protest against the basis of arbitration proposed by them."

The speaker remarked that any reduction in their wages at the present time was uncalled for, and, if anything, they ought to have the return of what was taken from them twelve months ago. Referring to trade unions, he said those institutions were different now to what they used to be, the men being much better educated; and without any attempt at coercion, every one was allowed to sell his labour as he thought proper. He believed, however, that those who were content to work at the reduced rate were working against their own interests, and that of their fellow-workmen. Mr. C. Korachich (mason) called upon them to oppose the return as strongly as possible. Surely, he said, there was honour enough among the workmen of Liverpool to enable them to be steadfast. Mr. W. Griffiths (bricklayer) said the men were always invited to arbitration when it was likely to go against them, but never when they were in the right. He had heard that there were iron and brass finishers in the Master Builders' Association (a Voice: "Yes, and shoemakers and tailors"). The resolution was carried unanimously, as was also a resolution to the effect that they would only accept arbitration on a fair and just basis.

PROVINCIAL NEWS.

Penzance.—Mr. S. J. Smith, Local Government Board inspector, has held an inquiry at Penzance respecting the application of the Town Council for a provisional order for the compulsory purchase of land for widening Market Jew-street and Albert-street, and for leave to borrow 3,800*l.* for works of water-supply, sewerage, and street improvements, the principal item being 3,000*l.* for the new Central-road through the Morrab-fields. No opposition was offered.——On the 29th ult. the new hall erected by the Penzance Public Hall Company was formally opened.

Plymouth.—Mr. Joseph Smith, Local Government Surveyor, has held a public inquiry at the Plymouth Guildhall, upon an application of the Town Council for powers to purchase property for various street improvements in the town. The improvements projected include the widening of Notte-street, Finewell-street, and St. Andrew's-street.

Books.

Needlework. By ELIZABETH GLAISTER, author of "Art Embroidery," &c. With Illustrations. Macmillan & Co. 1880.

THIS is one of the "Art at Home" series, and a great deal better treatise than some of that series, being much more free from affectation, and more based on principle, and less on mere fashion, than others we have noticed. The writer does not exaggerate the importance of her subject, but treats it simply and sensibly, and in a critical spirit in which there is little to differ from or call in question. She is aware that some portion of the fashion for "art-needlework" at present is little more than a fashion with no real knowledge of what constitutes "art" behind it, and is not afraid to hint that the very term "art-needlework" is one of which a definition would be not only not very easy, but "happily not very necessary." "If," she adds, "we can understand something of what art is, of the combination of knowledge, experience, skill, and originality, each in a high degree, that goes to the production of any real work of art, we shall understand that these qualities must be shown in our work before we can, without great presumption, give it so high a title." And that these qualities are not necessarily to be realised for merely working "in crewels on crash instead of, as formerly, in Berlin wool on canvas," or by "a blind and touching faith in South Kensington," and a persuasion that only there can art-needlework be had, are sentiments which, though really mere common-places, are unfortunately so unusual at present, that the mere fact of meeting with them in a book on such a subject is a fact to be noticed. The author is far from encouraging all her sisters to take up decorative needlework as a matter of course. "To those who cannot or will not take thought for, or spend money on, a good design for their decorative needlework, we can only say, 'Let it alone'; sew shirts, knit stockings, make flannel petticoats. . . . . If you say that these things are ugly, you must be flatly contradicted, in print at least, and told that the ugliest and most vulgar thing that a gentlewoman can take into her hands is badly-designed, coarsely-coloured, and ill-contrived work, which is certain to be an eyesore when it is completed and put into the place which it is intended permanently to disfigure." This is a plain and wholesome truth, to be borne in mind by those who are determined to be artistic, without a genuine perception of what "art" means. At the same time, she rightly encourages those who have even a little skill in drawing and designing, to endeavour to put something of their own into their work, rather than draw it all from some published design or pattern. Individual taste and feeling is what, in fact, we feel the want of greatly in the present widespread fancy for decorative adornment of the house. We go into house after house and find just the same kind of thing, the same stamp of furniture, the same kind of needlework; there is little to mark the individuality of the owner's taste in anything. In the chapter on designing which follows the introduction, the author expresses the opinion that there is too much taste for naturalism prevalent in the needlework designs of the present day which are drawn from nature; and we like the remarks on page 19 in regard to style of pattern: that "a good pattern in any particular style is not the production of any one person, though variations, arrangements, and developments may be made more or less happily by the person using it. It is the growth of years, the result of generations of thought and culture, the prophecy of what is to come, or it is the expression of the tastes and dispositions of a whole people. All the Italian Renaissance may be discerned in a piece of good cinque-cento ornament, all the love of ancient learning, all the restraints of scholarship, all the wealth and luxuriance of an age of revival pushing forward into vigorous new life. So with the work of Queen Anne's time; its magnificence is a little pedantic, and it is a reflection of many things that have little to do with decoration." This is very true and very well put. In recommending a well-judged coventionalism, however, it may perhaps be going rather too far to tell a needleworker who wishes to introduce, for example, a lion's head as a crest or emblem, to go to some old heraldic design for it rather than to the Zoological Gardens for the head of the real animal. Mr. Ruskin, in his Edinburgh lectures, drew precisely the opposite moral, and censured the Greeks for sculpturing a nondescript conventional tiger's head on their buildings instead of a life study of the original. The truth, we apprehend, lies between. We should say, go and sketch the real lion, and then conventionalise in the necessary manner for your work; you will thus be most likely to attain something of really leonine character even while avoiding a naturalism unsuited to the material. To do this well, however, presupposes, no doubt, considerable powers on the part of the artist; and where these are not present, the heraldic lion may no doubt do good service as providing a ready-made conventionalism: but only as a *pis aller*.

In recommending that the pattern be drawn by hand rather than mechanically traced or pounced, the author, perhaps, hardly puts the reason for this in the right way. She says that a pattern drawn in this way has varieties and individuality which are a great gain, and prevent a machine-like regularity. We quite agree that the latter quality is out of place in needlework design; but we opine that the variety, even if slight, should be obviously intentional and studied; not a mere variety in the outlining of a similar leaf, but obvious and studied variety. Strictly symmetrical designs are unsuitable for needlework, because they cannot, owing to the nature of the material, be carried out with perfect symmetry, and it is a mistake to convey the impression that something has been attempted which has not been quite accomplished. For this reason the Italian pattern for a curtain design, given on p. 38, though charming in itself, is not a model pattern for needlework; it intends a symmetry which can only be carried out with difficulty, and, even then, imperfectly.

Like so many other people at present, the writer makes a little too much of Japanese work. It can hardly be said that the "character of unexpectedness and apparent disorder" which, no doubt, gives to Japanese work a good deal of what may be called its peculiar *bouquet*, is produced "by obeying, not defying, the laws of symmetry, harmony, and proportion." It would be difficult to say what law of "symmetry" is illustrated in the class of design referred to; and the remark is hardly in accord with what is very truly said a few pages further on, that "a great characterestic of good design is in the careful proportioning of the ornament to the place it is to occupy, and regarding of the lines that are to confine it." This is certainly not a characteristic of Japanese ornament, which in this respect is not entirely good, in spite of its other brilliant qualities. We quite concur with the writer, however, in the advice not to follow Japanese models so closely as to provoke a comparison with them; because the peculiar taste illustrated in Japanese ornament pleases partly from its essentially spontaneous character,—a quality which cannot be feigned or imitated with any success.

The general directions and suggestions given for treating with decorative needlework various classes of objects seem to be throughout excellent, and the few illustrations in general suitable and well chosen. We can cordially recommend the book.

VARIORUM.

"THE Construction of Large Tunnel Shafts," a practical and theoretical essay, by Mr. J. H. Watson Buck, C.E., of the London and North-Western Railway, is published by Crosby Lockwood & Co. Mr. Buck has had considerable practical experience in the construction of tunnels, and is, moreover, able to reason out theoretically the cause of results. No one who is acquainted with tunnel work will fail to perceive the advantage of being able to work every stone in the base of a large shaft by means of templates above ground, thus ensuring accurate workmanship, and effecting a saving of time, which is important where excavation has to be temporarily supported during progress. A study of this book will give that power; it is a very useful addition to the technical library. The *Coupe de Pierre* deserves more study even from architects than it receives.——A "Treatise on Mountain Roads, Live Loads, and Bridges," by Lieutenant-General H. St. Clair Wilkins (E. & F. N. Spon), is the result of the writer's own experience and reasoning, and not a repetition of what has been said on the subject by others. Lieutenant-General Wilkins's experience is especially Indian, but its application may be extended to other countries. He has a strong preference, under ordinary circumstances, for masonry bridges over iron ones, and has accordingly entered into considerable detail with regard to the design, construction, and restoration of such structures.——The "Quarterly Statement (for January) from the Palestine Exploration Fund" (11, Charing-cross), which we have accidentally missed seeing until now, contains a long and important paper on "The Masonry of the Haram Wall," by Lieut.-Colonel C. W. Wilson, C.B. It is illustrated with numerous plans and sections.——The *Gentleman's Magazine* (Chatto) for April, includes Dr. B. W. Richardson's excellent lecture on "Dress in Relation to Health." This ought to be widely read.——The first part of "Sunrise, a Story of these Times," by William Black (Sampson Low & Co.), is singularly interesting, and makes us long for the next instalment. Fifteen monthly parts are to complete the book.

Scaffold Accident in Liverpool.—Shortly before noon on Wednesday last a scaffold accident occurred at a new tunnel which is being made near the Dingle, South End, Liverpool, for the Cheshire Lines Committee, by which six men were more or less injured. The men were in the employ of Messrs. Scott & Edwards, contractors, Toxteth Park, and were working on a scaffold some 40 ft. above the ground, when, without the slightest warning, it gave way, precipitating the whole of them to the ground. They were conveyed to the Royal Southern Hospital.

Miscellanea.

Manchester Scientific Students' Society. This society paid a visit the other day to Messrs. W. H. Bailey & Co., Albion Works, Salford. They were met by Councillor W. H. Bailey and his manager, Mr. Lawson, by whom the various machines were described. The number of the manufactured articles and variety are marvellous. Among others may be enumerated turret-clocks, water and steam gauges, injectors, reducing and other valves of all sizes, bells, hand fire-pumps and steam-pumps, steam whistles, once known as "bussars," or "American devils." Under the latter name these whistles came into general use in mills and workshops, but the nuisance to outsiders became so great that it was, some years ago, suppressed by Act of Parliament. The whistle employed on locomotive engines is exactly the same in character, and is made here in large numbers. A gigantic specimen was made for Professor Tyndall, and used by him in his experiments on sound at the South Foreland lighthouse. Here, too, was an elegant turnstile, one of a couple of dozen ordered for the government at Constantinople. The boring, planing, and slotting machines were examined; also a drilling-machine, made by the late Richard Roberts (Sharp, Roberts, & Co.), and still doing good work; a hydraulic motor-pump, and Mr. Bailey's patent hydraulic organ-blower—a machine which dispenses with the services of a once-important functionary. In the next room was seen the automatic machinery by which brass taps and valves are made with extraordinary precision and rapidity; also Sutcliff's patent reversible valve. Occupying a very small space was an electric fire-alarm apparatus, made for the Bombay cotton-mills, of a character so sensitive that by merely breathing upon a thin steel bar the alarm-bell was set ringing. A portable hydraulic test-pump was put into operation, and in a few seconds exerted upon a thick indiarubber tube a pressure of 250 lb. upon the square inch. In Germany and Russia the users of steam-boilers are obliged by law to test them periodically each year. A bar of cast-iron, 36 in. by 1 in. by 2 in., was placed in Mr. Bailey's patent testing machine, and by means of a lever, with a self-recording weight, was broken under a pressure equal to 24 cwt.; whilst a second bar did not succumb until it was subjected to a pressure of 30 cwt. In a somewhat similar machine,—made for the Royal Engineers, Chatham, and invented by Professor Thurston,—metals and alloys were tested by torsion, their breaking point being shown in a diagrammatic form upon a sheet of ruled paper. In another machine, designed by Mr. Bailey for the contractors who are erecting the new Eddystone Lighthouse, was placed a small block of cement of a suitable shape and size, 1¼ in. by 1¼ in. This fragment was torn in two by a tensile strain of 1·180 lb. In the third machine, worked by hydraulic power, cement, stones, and other building materials are subjected to a test, by means of which their power of resisting a crushing force is indicated and registered.

Walker *v.* Dennett & Co. — At the adjourned hearing of this case, before Mr. Newton, Marlborough-street Police-court, it was stated that Messrs. Kirk & Randall had given notice of works at 28, Haymarket, of which the district surveyor had not previously received notice, and they then agreed to be answerable for the whole of the works, whether executed by themselves or others. The district surveyor accordingly withdrew the summons, but said he had now to ask for three summonses against Messrs. Kirk & Randall, arising out of the notice they had given. That notice he had sought to obtain merely as a preliminary, to enable him to ascertain whether to proceed against Messrs. Dennett & Co., or against Messrs. Kirk & Randall. The three summonses he now applied for would raise important points under the Building Act, which points must be settled by the learned magistrate. Mr. Newton granted the summonses.

Architectural Opera.—At the *soirée* of the Architectural Association, to be held this (Friday) evening, the 9th inst., a short operatic sketch, on the architectural topics of the day, will be produced under the direction of Mr. Stannus.

Fire.—We are informed that it was not Northampton Town-hall that was recently injured by fire, as stated in several quarters, but the Town-hall at Towcester.

King Alfred's Palace at Wedmore.—The excavations in King's Court Garden, near Wedmore, under the management of the Rev. S. Hervey, are (says a Bristol paper) on the eve of being closed. Mr. Hervey has not only been busily engaged of late in taking up the stones, taking down the mounds, filling up the pits, and levelling the ground fit to be sown down, but he has followed the large causeway towards the centre of the building, and has come across some very curious foundations in various parts of the field, so that the ground-plan of the palace will be far more perfect than it was at the suspension of the works at the fall of last year. Mr. Hervey has had the satisfaction of opening and bringing to light the foundations of a building for its day one of the largest in England, and of no mean origin; for it is supposed to have been graced with the presence of several of the West Saxon kings in Wessex, and was the house and property of King Alfred the Great. A paper on the subject, read by Mr. Hervey at the Congress of the Royal Archæological Institute held in Taunton last year, was reported on p. 943 of the last volume of the *Builder*.

A Deep Artesian Well.—The artesian well near Buda-Pesth is now completed. The works were commenced in 1868. The total depth is 3,200 ft., and the temperature of the water it yields is nearly 165° Fahr. The temperature of the mud brought up by the borers was taken every day, and was found to increase rapidly, in spite of the loss of heat during its ascent, down to a depth of 2,300 ft. to 2,700 ft. Beyond this point the increase was not so marked. At a depth of 3,000 ft. the temperature was 177° Fahr., giving an average increase of 1° for every 23 ft. bored. Water first commenced to well up at a depth of 3,070 ft. Here its temperature was 110° Fahr., and from this point onward it rapidly increased both in quantity and temperature. Thus, at 3,092 ft. its temperature had already risen to 150°Fahr., and the yield in twenty-four hours from 9,500 gallons to 44,000 gallons.

The Electric Light. — The *Telegraphic Journal* of April 1st contains a description of a new form of lamp for the electric light, which has recently been invented by Mr. Charles Stewart, M.A. It consists of a number of square carbon rods placed radially upon a disc of wood or metal, in such a manner that the inner ends of the carbon rods form a complete circle. The advantages claimed for this lamp are:—1. It is automatic in its action. 2. It is capable of burning for a very considerable period. 3. It does not throw shadows. 4. It is of simple [and comparatively inexpensive construction. 5. The intensity of the light may be increased if so desired.

Cromwell House.—Mrs. C. J. Freake entertained a large number of friends on Wednesday afternoon last with an admirable presentment of Mr. W. S. Gilbert's charming little play, "Sweethearts." Mr. Coghlan acted in his original part *Harry Spreadbrow*, Miss Williams played *Miss Jane Northcott*, Mr. Arthur Schwale was *Wilcox*, the gardener, and Miss L. Burgess Swift, *Ruth*, the maid. Miss Williams, in the first act, had the advantage over the original personator of the character, Mrs. Bancroft, of extreme youthfulness, and acted with remarkable ease and grace. H.R.H. the Duchess of Teck, the Duke of Teck, and many notabilities were amongst the visitors.

Bank Shutters.—In our issue of June 28th last we gave an illustration and description of Messrs. Drummond's bank at Charing-cross. It is now fast approaching completion, and will form a prominent architectural feature of the neighbourhood. Salmon, Barnes, & Co., engineers of Ulverstone, have fitted up the ground-floor and basement with iron bank-shutters, worked by their patent balance-weight motion, with facilities for raising and lowering from the inside, the appearance and motion of which are very good. Many public and private buildings have been already provided with these shutters by the same firm.

The Site of Horsemonger-lane Gaol.—The magistrates of the county of Surrey have rejected the petition of the inhabitants of the parishes south of the Thames for the conversion of the site of Horsemonger-lane Gaol into a public recreation-ground, and the area, which is about 2 acres, will be put up for sale by public auction in May.

Mr. J. Dick Peddie, architect, Edinburgh, has been elected M.P. for the Kilmarnock burghs.

Mr. T. H. Wyatt.—For some time past the state of Mr. Wyatt's health has been such as to cause his friends uneasiness. We are unaffectedly glad to be able to say that he is better, and contemplates an early return to town.]

Manchester Society of Architects.—A handsome list of prizes to be competed for by students in the offices of Manchester architects, or of any member of the society, has been issued. Mr. John Holden is the hon. secretary.

Nettlefolds (Limited).—This will be the title of an important company now in course of formation to take over five large businesses in Birmingham and elsewhere. The particulars, which some may find worth attention, may be seen in our advertising columns.

Institution of Surveyors.—At the next meeting, to be held on Monday evening, April 12th, a paper will be read by Mr. C. G. Saunders (Member), entitled "Quantity Practice."

TENDERS

For roads and sewers at Woodford:—

Crockett	£4,343 0 0
Lingie	3,650 0 0
Thompson	3,440 0 0
F. Jackson	3,400 0 0
Peal	3,380 0 0
Nowell & Co.	3,360 0 0
Killingback	3,255 0 0
Harris	3,247 0 0
Piazey	3,225 0 0
Jackson	3,200 0 0
Bloomfield	3,199 17 10
Acock	3,194 0 0

For the construction of an impounding reservoir at Yarlington, for Mr. T. B. Rogers. Mr. J. B. Haynes, surveyor:—

Hobbs (accepted)	£270 7 0

For repairs to farmhouse and buildings at Nightingale Hall Farm, Edmonton. Mr. J. S. Gomme, architect:—

Hobson	£1,019 0 0
Ansell	977 0 0
Field & Sons	815 15 0
Cross	495 0 0
Almond	490 0 0

For sewerage works at Carlton, near Nottingham, for the Basford Rural Sanitary Authority. Mr. John Parker, engineer:—

Beardsley & Pounder	£3,519 0 0
Wing	3,440 4 0
Kellett & Bentley	3,430 0 0
Foster & Barry	3,385 0 0
Bell	3,348 0 0
Williams	2,675 0 0
Rushworth	2,400 3 0
Meats Bros. (accepted)	2,230 0 0

For the restoration of Stonegrove Houses, Stanmore, Middlesex. Mr. C. G. Wray, architect. Quantities by Messrs. Linsdell & Giffard:—

Vernall & Griffiths	£2,998 0 0
Bamford	2,636 0 0
Gentry	2,275 0 0
Staines & Son	2,268 0 0
Kinninmont & Son	2,029 9 0

For the erection of a portion of school and chapel at Hyson-green, Nottingham. Mr. C. G. Wray, architect. Quantities by Messrs. Linsdell & Giffard:—

Bromage	£743 0 0
Lee	741 0 0
Dennett & Co.	731 5 0
Wheatley & Maule	645 0 0
Tutin	621 2 0

For alterations and additions to Northolt Vicarage, Middlesex. Mr. C. G. Wray, architect. Quantities by Messrs. Linsdell & Giffard:—

Fassnidge	£647 0 0
Adamson	631 0 0
Haines	598 0 0
Nye	589 0 0

For alterations and additions to the Union Club, King's-road, Brighton. Messrs. Scott & Hyde, architects. Quantities by Mr. F. W. Hyde:—

Lockyer	£1,113 18 0
Lynn	993 0 0
Cheeseman & Co. (accepted)	975 0 0

For alterations and additions to No. 23, Ship-street, Brighton. Messrs. Scott & Hyde, architects. Quantities by Mr. F. W. Hyde:—

Patching & Son	£1,539 0 0
Cheeseman & Co.	1,529 0 0
Garrett	1,498 0 0
Lockyer	1,347 0 0
Barnes (accepted)	1,330 0 0

For re-building of premises in Brent-street, Hendon, after fire, for Mr. R. H. Jolly. Messrs. Smithies & Gladman, architects:—

Nash (accepted)	£500 0 0

For erection of foreman's cottage, at Kew Bridge, for Messrs. Jupp & Sons, maltsters. Messrs. Smithies & Gladman, architects:—

Beauchamp	£197 0 0
Brunsden	294 0 0
Head (accepted)	225 0 0

For building residences and conservatory for Mr. Bigsley, Tunsley-lane, Deptford. Mr. Cadney, architect. Quantities not supplied:—

	Residence.	Conservatory.
Dunford & Langham	£2,085	£199
Williams	1,900	125
Downs & Co.	1,539	70
Battley	1,495	98
Roberts	1,440	—
Bolding	1,435	116

For re-building Axe and Cleaver Hotel, Altrincham, Manchester:—

Napier	£2,570	0	0
Neill & Sons	2,530	0	0
Holt	2,485	0	0
Wilson, Toft, & Co.	2,483	0	0
Wood	2,449	0	0
Thompson	2,382	0	0
Harrower	2,370	0	0
Williams	2,369	0	0
Stone	2,360	0	0
Rems & Evans	2,290	0	0
McFarlane	2,160	0	0

For extension and tower of St. Luke's Church, Uxbridge-road. Mr. C. H. M. Milcham, architect. Messrs. Gardner, Son, & Theobald, surveyors:—

	Larger Extension.	Seating.	Tower.
Longmire & Burge	£1,833	£555	£1,939
Gibson	1,789	535	2,085
Langmead & Way	1,754	493	2,095
W. Nye	1,735	535	2,100
J. Boarder	1,729	525	2,094
Adamson & Son	1,653	494	1,967
Dorey	1,512	146	1,843

For new roads, pipe-sewers, and surface water-drains on the British Land Company, George-lane Station Estate, Woodford. Mr. Henry B. Michell, surveyor:—

Crockett	£3,325	0	0
Harris	3,247	0	0
McKenzie & Co.	2,820	0	0
Keeble	2,720	0	0
John Jackson	2,630	0	0
Thompson & Covington	2,618	0	0
Peill	2,484	0	0
Nowell & Robson	2,445	0	0
Jesse Jackson	2,440	0	0
Pizzey	2,426	0	0
Acock (accepted)	2,425	0	0
Killingback	2,415	0	0
Bloomfield	2,379	10	0

For constructing a brick-sewer, and widening a portion of George-lane, Woodford. Mr. Henry B. Michell, surveyor:—

Crockett	£918	0	0
Killingback	840	0	0
McKenzie & Co.	830	0	0
Thompson & Covington	822	0	0
Bloomfield	820	7	10
Nowell and Robson	815	0	0
Pizzey	798	10	0
Peill	785	0	0
John Jackson	770	0	0
Acock (accepted)	769	0	0
Jesse Jackson	760	0	0
Keeble	752	0	0

For new road and sewer-making on the British Land Company's Estate, at Weston-super-Mare, Somerset. Mr. Henry B. Michell, surveyor:—

Wilksons & Son	£9,054	0	0
Harris	7,770	0	0
Jackson	7,720	0	0
Nowell & Robson	7,700	0	0
Acock	7,671	0	0
Pizzey	7,630	0	0
Humphreys	7,487	0	0
McKenzie & Co.	7,300	0	0
Thompson & Covington	6,761	0	0
Bloomfield	6,724	0	0
Killingback	6,682	0	0
Cowlin & Son	5,950	0	0
Krauss (accepted)	5,777	0	0

For repairs, &c., to "Lynton," Upper Tooting. Mr. R. Roberts, architect:—

Ashley Bros.	£327	0	0
McLachlan & Sons	313	0	0
R. & E. Smith	245	0	0

For the construction of roads, sewers, manholes, &c, on the Clement's Estate, Ilford, Essex, for Messrs. J. A. & A. Withers. Messrs. Whitmore & Kennard, surveyors:—

Botterill	£2,937	0	0
G. Harris	2,397	0	0
Bell	2,245	0	0
Killingback	2,221	0	0
W. Harris	2,020	0	0
Neave	1,477	0	0
Jackson	1,666	0	0
Pound	1,590	0	0
Pizzey	1,442	0	0
Cardus	1,250	0	0

For the erection of house at Blackwell, near Bromsgrove, for Mr. R. H. Milwood. Messrs. Osborne & Reading, Birmingham, architects:—

Wilson & Son	£1,285	0	0
Briley	1,260	0	0
Partridge	1,195	0	0
Bowen	1,097	0	0
Horsman & Co.	1,090	0	0
Robinson	1,081	0	0
Brazier & Weaver	1,058	0	0
Pritchard & Feltham	1,058	0	0
Hill (accepted)	978	0	0

For repairs, paintwork, decoration, &c., at No. 104, Eaton-place, S.W., for Major Porter. Mr. Augustus E. F. Spratt, architect:—
Wright & Mansfield (accepted).

For a new residence at Enton, Witley, Surrey, for Mr. F. E. Eastwood, J. P. Mr. Henry Peak, architect. Quantities supplied:—

Goddard & Sons	£10,252	0	0
Moon	9,550	0	0
Harris	9,304	0	0
Mitchell Bros.	8,347	0	0
Martin, Wells, & Co.	8,341	0	0

For alterations at 397, New Cross-road. Mr. Percy Monckton, architect:—

Taylor & Son	£463	0	0
Banks	445	0	0
Redmund	425	0	0
Hall	395	0	0

St. James's, Forest Gate.—Mr. Stephenson (not "Stevenson"), says the amount of his Tender was £4,699*l.*

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A. C. S.—M.—R. B.—H. P.—G. & H.—C. L.—R. S. B.—W. H. P.—D. A. O.—A. G. B.—E. S.—D. W.—P. & F.—A. B.—J. F.—K. & D.—H. B. M.—L. & W.—F. W. R.—H. C. S.—F. L.—R. C. P.—W. C (any of the speaking-tube makers could supply a flexible spring end of the kind described).—A. E. S. (should have sent amounts and other names).—T. S. (any stone-merchant).—J. B. (next week).—R. S. (next week).—T. M. L. (next week).

All statements of facts, lists of tenders, &c. must be accompanied by the name and address of the sender, not necessarily for publication.

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